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HOWARD CAMPBELL, Editorial Director
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Volume 4 | OCTOBER, 1939 | Number 1

Published monthly by
Gardner Publications, Inc.
431 Main St.
Cincinnati, Ohio

DON G. GARDNER
President and
General Manager

JOHN M. KRINGS
Advertising Manager

GEORGE E. HAY
431 Main St., Cincinnati
Main 0182

G. M. FILLMORE
JOHN VANDERVOORT
342 Madison Ave.,
New York
Murray Hill 6-8899

GEORGE H. MEYERS
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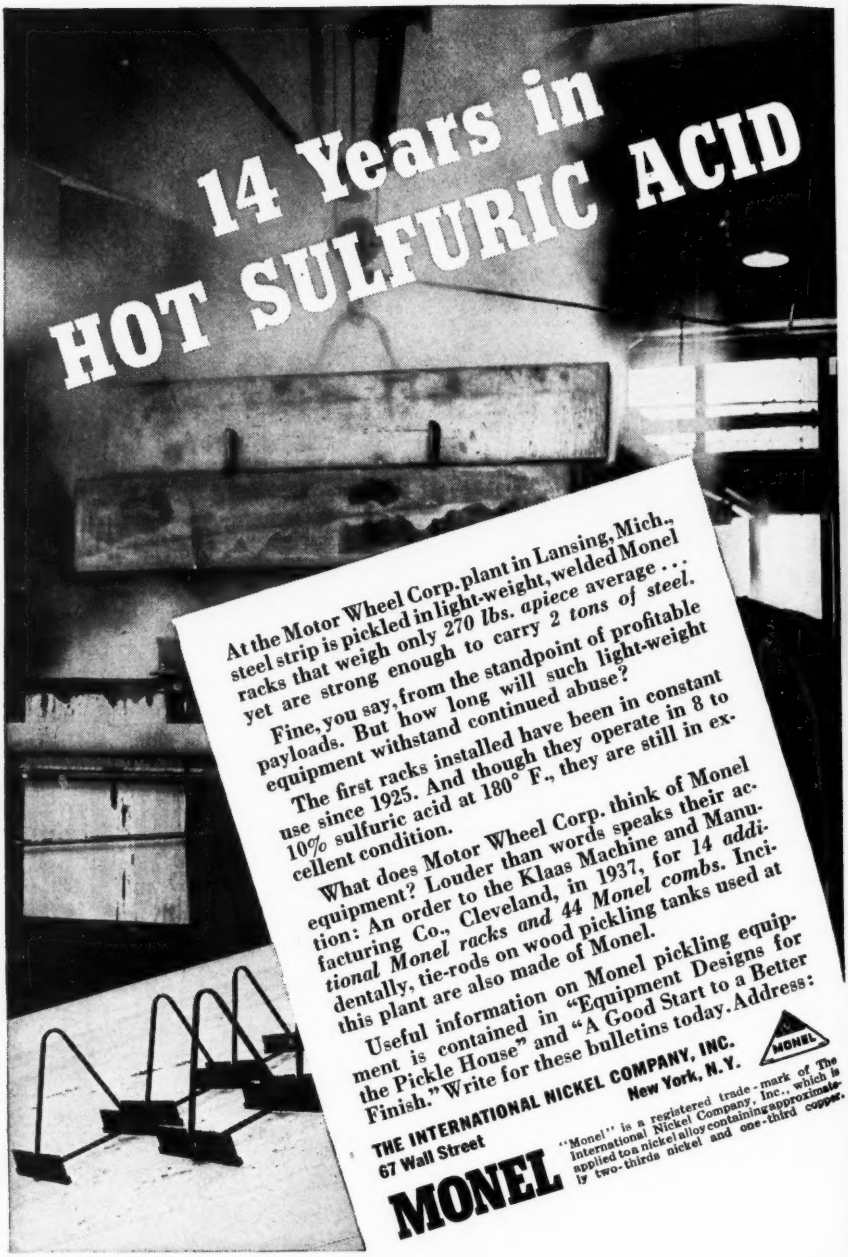
More Than 14,750 Circulation This Issue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OCTOBER, 1939

NATIONAL METALS CONGRESS AND EXPOSITION

CHICAGO will be the 1939 host to the four societies who will co-operate in presenting the 21st Annual Metal Congress and Exposition which is to be held in that city October 23 to 27, inclusive. The four societies are the American Society for Metals, The Wire Association, American Institute of Mining and Metallurgical Engineers, and the American Welding Society.

Advance hotel and society reservations point to one of the heaviest enrollments in the history of the Metal Congress, and optimism is high among the more than two hundred exhibitors and thousands of members of the four component societies. According to W. H. Eisenman, secretary of the American Society for Metals,

which is the sponsoring society, and managing director of the Exposition, the war in Europe has stimulated the demand for exhibition space. The men who will attend this show will be more than ordinarily interested this year because they will have a keen and highly specialized interest in the problems that may arise in the next few months. Those who are able to anticipate some of their problems will be looking for answers at the National Metal Congress and Exposition.

Business has taken a definite upturn and, according to Mr. Eisenman, it is an interesting fact that attendance at the Metal Shows has always been heaviest during the years when industrial production was at its peak. It is also interesting to note that advance room reservations in all of the hotels in Chicago are ahead of previous years. The rush of requests for space at the Metal Exposition indicates that manufacturers feel that this is the logical time to demonstrate their newest developments to the industrial executives who visit the Metal Congress and Exposition.

The Metal Exposition will be held at the International Amphitheatre. Technical sessions of the various societies will be held as follows:

American Society for Metals: The Palmer House

The Wire Association: Congress Hotel

American Institute of Mining and Metallurgical Engineers: Blackstone Hotel

American Welding Society: Hotel Stevens.

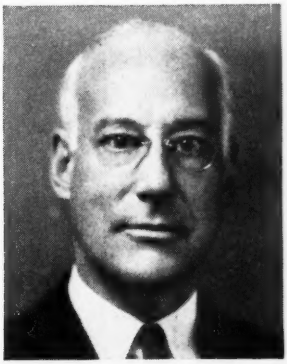
Inasmuch as Chicago is the location of some of America's greatest industries, visitors to the Metal Congress and Exposition will be able to enjoy the exceptional opportunity which will be afforded to them to visit some of these great plants. Among the plants included on the list at press time are the Western Electric Company, Electro - Motive Corporation, Carnegie - Illinois Steel Corporation, Inland Steel Company, International Harvester Company's Tractor Works, Chicago Latrobe Twist Drill Works, Stewart-Warner Corporation, American Can Company, and Lindberg Steel Treating Company. In addition to these, special plant visits will be arranged for the different associations to enable their members to study processes with which their industries are directly connected or in which they are especially interested.

Altogether, the technical sessions in which papers on newest developments will be presented by outstanding figures in the various societies, the interesting plant visits, and the Exposition will provide an opportunity for the engineer or plant executive to bring his knowledge of his industry up to date and thus keep himself abreast of the times.

Officers of American Society for Metals

(Right) W. P. Woodside, *President, Climax Molybdenum Corporation.*

(Below) Bradley Stoughton, *Treasurer, Lehigh University.*



(Above) J. P. Gill, *Vice President, Vanadium-Alloys Steel Company.*

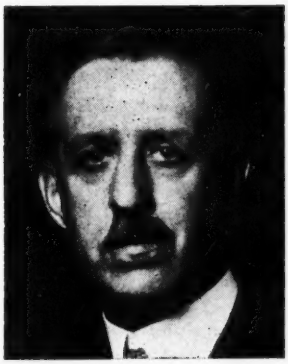
(Left) W. H. Eisenman, *Secretary.*

Floor plan of the International Amphitheatre, Chicago, Illinois.

Trustees of American Society for Metals

(Below) G. B. Walterhouse, *Massachusetts Institute of Technology.*

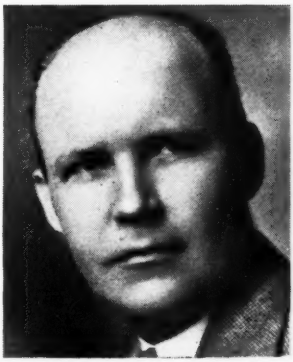
(Above) S. L. Hoyt, *A. O. Smith Corporation.*



(Above) D. S. Clark, *California Institute of Technology.*

(Left) H. A. Anderson, *Western Electric Company.*

(Right) F. B. Foley, *Midvale Company.*



Floor plan of the International Amphitheatre, Chicago, Illinois.

CONVENTION PROGRAM OF AMERICAN SOCIETY FOR METALS

Technical Sessions at The Palmer House

MONDAY MORNING, OCTOBER 23rd

Impact Properties of Some Low Alloy Nickel Steels at Temperatures Down to (—)200 Degrees Fahrenheit,
T. N. Armstrong and A. P. Gagnebin, International Nickel Co., New York

The Effect of Titanium on the Macro-Structure and Grain-Coarsening Temperature of Forging Steel,
G. F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

Introductory Study of the Nitriding of Hardened High Speed Steel by the Use of Molten Cyanides, J. G. Morrison, Landis Machine Co., Waynesboro, Pa. and J. P. Gill, Vanadium-Alloys Steel Co., Latrobe, Pa.

Some Practical Notes on High Speed Steel Forgings,
W. H. Wills, Allegheny-Ludlum Steel Corp., Dunkirk, N. Y.

Simultaneous Session

The Stress-Strain Characteristics of the Torsion Impact Test,
O. V. Greene and R. D. Stout, Carpenter Steel Co., Reading, Pa.

The Influence of Magnetic Fields on Damping Capacity,
E. R. Parker, General Electric Co., Schenectady, N. Y.

The Interrelation Between Stress and Strain in the Tensile Test,
E. J. Janitzky and M. Baeyertz, Carnegie-Illinois Steel Corp., Chicago

The Fatigue Resistance of Steel as Affected by Acid Pickling,
G. L. Kehl and C. M. Offenhauer, Lehigh University, Bethlehem, Pa.

MONDAY AFTERNOON, OCTOBER 23rd

Creep Rates From Tests of Short Duration,
J. J. Kanter and E. A. Sticha, Crane Company, Chicago

Characteristics of 5 and 7 Per Cent Chromium Steels With Varying Molybdenum and Vanadium Content.....W. G. Hildorf, Timken Roller Bearing Co., Canton O., and C. L. Clark and A. E. White, University of Michigan, Ann Arbor, Mich.

Stress Corrosion-Cracking of the Austenitic Nickel Steels and Its Industrial Implications.....J. L. Miller, Armour Institute of Technology, Chicago, and J. C. Hodge, Babcock & Wilcox, Barberton, Ohio

Ferromagnetic Austenite,
L. P. Tarasov and E. R. Parker, General Electric Co., Schenectady, N. Y.

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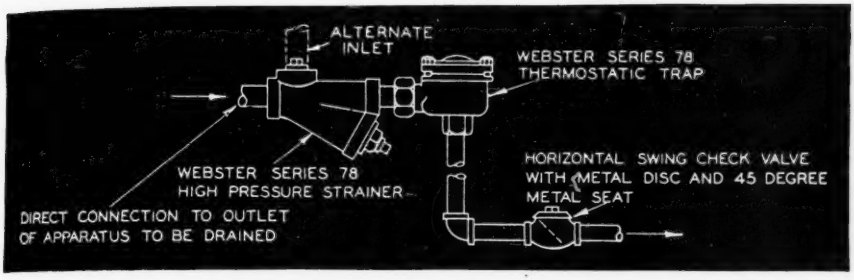
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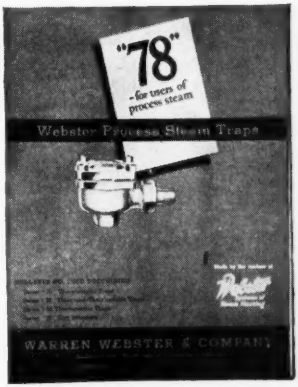

Educational Lectures

4:30 P.M.—Nature of Stresses With Iron,
E. C. Bain, United States Steel Corp., Pittsburgh

8:00 P.M.—Visual Examination of Steels—Macroscopic Technique,
G. M. Enos, University of Cincinnati, Cincinnati, O.

TUESDAY MORNING, OCTOBER 24th

An Analysis of Machinability Data From Cold-Finished and Heat-Treated S.A.E. 1045 Steel,
O. W. Boston and W. W. Gilbert, University of Michigan, Ann Arbor, Mich.

A Discussion of Lead Bearing Steel,
F. J. Robbins and G. R. Caskey, Bliss and Laughlin, Inc., Harvey, Ill.

Precipitation Hardening Characteristics of High Purity Aluminum-Copper and Aluminum-Copper-Iron Alloys,
H. Y. Hunsicker, Aluminum Company of America, Cleveland, O.

Drawing of Aluminum,
L. J. Weber and J. T. Weinzierl, The Aluminum Cooking Utensil Co., New Kensington, Pa.

Simultaneous Session

Annealing of Low Carbon Rimmed, Aluminum-Killed and Silicon-Killed Steels, W. P. Wallace, Columbia Steel Co., Torrance, Cal., and R. L. Rickett, U. S. Steel Corp., Kearny, N. J.

The Prevention of Flakes by Holding Railroad Rails at Various Constant Temperatures...R. E. Cramer and E. C. Bast, Univ. of Illinois, Urbana, Ill.

Selection of Steel and Heat-Treatment for Spur Gears,
H. B. Knowlton and E. H. Snyder, International Harvester Co., Chicago, Ill.

TUESDAY AFTERNOON, OCTOBER 24th

Time Quenching...J. L. Burns and Victor Brown, Republic Steel Co., Chicago

A Test Method for the Evaluation of Aqueous Quenching Media for Steel Hardening.....F. W. Trembour and Howard Scott, Westinghouse & Electric Manufacturing Co., E. Pittsburgh, Pa.

Hardenability Variations in Alloy Steels; Some Investigations with the End-Quench Test.....G. T. Willliams, Cleveland Tractor Co., Cleveland, O.

A Hardenability Test for Shallow Hardening Steels,
W. E. Jominy, General Motors Corp., Detroit

Educational Lectures

4:30 P.M.—Elements Dissolved in Austenite,
E. C. Bain, U. S. Steel Corp., Pittsburgh

8:00 P.M.—Visual Examination of Steels—Macro Etching,
G. M. Enos, University of Cincinnati, Cincinnati, Ohio

WEDNESDAY MORNING, OCTOBER 25th

Annual Meeting and Campbell Memorial Lecture,
E. S. Davenport, U. S. Steel Corp., Kearny, N. J.

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The Effect of Hardness and of Temperature on the Strength, Ductility, and Toughness of a Heat-Treated Carbon Steel,
S. W. Lyon, University of Illinois, Urbana, Ill.

Hardness Characteristics of Some Medium Carbon S.A.E. Steels,
P. Kalin and C. H. Lorig, Battelle Memorial Institute, Columbus, O.

The Accelerating Effect of Certain Metallic Elements on Graphitization....H. A. Schwartz, V. Fiordalis, J. L. Fisher, J. F. Shuman and M. F. Trinter, National Malleable & Steel Castings Co., Cleveland

WEDNESDAY AFTERNOON, OCTOBER 25th

Transformation of Austenite on Quenching High Purity Iron-Carbon Alloys,
T. G. Digges, National Bureau of Standards, Washington, D. C.

Kinetics of the Austenite—Martensite Transformation in Steel,
A. B. Greninger and A. R. Troiano, Harvard University, Cambridge, Mass.

The Mechanical Properties of the Isothermal Decomposition Products of Austenite.....M. Gensamer, E. B. Pearsall and G. V. Smith, Carnegie Institute of Technology, Pittsburgh, Pa.

The Spheroidizing of Steel by Isothermal Transformation.....P. Payson, W. Hodapp and J. Leeder, Crucible Steel Co. of America, Harrison, N. J.

Educational Lectures

4:30 P.M.—Carbide Forming Elements, E. C. Bain, U. S. Steel Co., Pittsburgh

8:00 P.M.—Visual Examination of Steels—Other Methods of Testing,
G. M. Enos, University of Cincinnati, Cincinnati, Ohio

THURSDAY MORNING, OCTOBER 26th

Bright Hardening of Tool Steels Without Decarburization of Distortion,
J. R. Gier and Howard Scott, Westinghouse Elec. & Mfg. Co., E. Pittsburgh

Hardness Conversion Relations for Hardened Steels.....H. Scott and T. H. Gray, Westinghouse Elec. & Mfg. Co., E. Pittsburgh

Hardenability Studies on Tool Steels,
A. J. Scheid, Jr., Columbia Tool Steel Co., Chicago Heights, Ill.

Simultaneous Session

Nickel-Tungsten System.....W. P. Sykes and F. H. Ellinger, General Electric Co., Cleveland

The Effect of Humidity of Air on the Oxidation of a Low Carbon Steel,
C. A. Siebert, University of Michigan, Ann Arbor, Mich., and H. G. Donnelly, Wayne University, Detroit

Heat Etching As a Means of Revealing Austenite Grain Size,
M. J. Day and J. Austin, United States Steel Corp., Kearny, N. J.

The Tempering of High Speed Steels.....Morris Cohen and P. K. Koh, Massachusetts Institute of Technology, Cambridge, Mass.

THURSDAY AFTERNOON, OCTOBER 26th

Symposium on Precipitation Hardening (Age Hardening) of Metals

Introduction to Precipitation Hardening,
Zay Jeffries, General Electric Co., Cleveland

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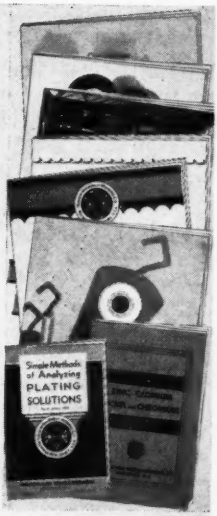

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The Application of Solid Solution and Precipitation Hardening Effects in Aluminum Alloys.....L. W. Kempf, Aluminum Co. of America, Cleveland

Precipitation Hardening of High Purity Binary and Ternary Aluminum-Copper Alloys.....W. L. Fink, D. W. Smith and L. A. Willey, Aluminum Company of America, New Kensington, Pa.

Precipitation Hardening in the Heavy Alloys,
W. P. Sykes, General Electric Co., Cleveland

Educational Lecture

4:30 P.M.—Design of Alloy Steels for Different Uses,
E. C. Bain, U. S. Steel Corp., Pittsburgh

FRIDAY MORNING, OCTOBER 27th

Educational Lecture

9:00 A.M.—Review of Principles Involved,
E. C. Bain, U. S. Steel Corp., Pittsburgh

Symposium on Precipitation Hardening (Age Hardening) of Metals

Age-Hardening Copper Alloys,
D. K. Crampton, Chase Brass and Copper Co., Waterbury, Conn.

Age-Hardening of a Copper-Cobalt and a Copper-Iron Alloy....R. B. Gordon, Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa., and M. Cohen, Mass. Inst. of Tech., Cambridge

Precipitation Hardening in Nickel-Base and Precious Alloys,
N. B. Pilling and A. M. Talbot, International Nickel Co., Bayonne, N. J.

Aging in Iron and Steel,
R. L. Kenyon and R. S. Burns, American Rolling Mill Co., Middletown, Ohio

FRIDAY AFTERNOON, OCTOBER 27th

Symposium on Precipitation Hardening (Age Hardening) of Metals

The Role of Strain in Precipitation Reactions in Metals,
R. H. Harrington, General Electric Co., Schenectady, N. Y.

Theories of Precipitation Hardening,
R. F. Mehl, Carnegie Institute of Technology, Pittsburgh

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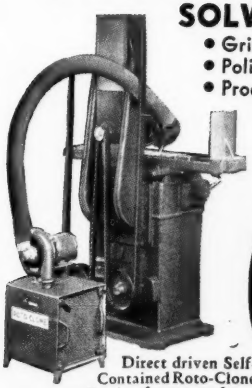
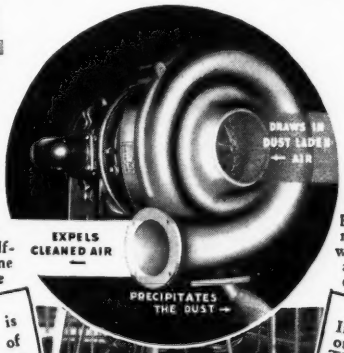


Direct driven Self-Contained Roto-Clone collecting from a surface grinder.



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Technical Sessions at the Blackstone Hotel

MONDAY, OCTOBER 23rd

9:00 A.M.—Registration, Ball Room Floor

Institute of Metals Division

10:00 A.M.—Ball Room

A Laboratory Study of the Reactions Occurring Between Molten Zinc Alloys and Pressure Die Casting Equipment—By E. A. Anderson, Chief, Metal Section, Res. Div.; Gerald Edmunds, Investigator; C. W. Siller, Phy. Chem. and Investigator Res. Div., The New Jersey Zinc Co.

A High Strength Silicon Brass Die Casting Alloy—By Alan U. Seybolt, Res. Met.; and B. W. Gonser, Supervising Met., Battelle Memorial Inst.

Iron and Steel Division

10:00 A.M.—Art Floor

The Pitting of Stainless Steels—By H. H. Uhlig, Res. Assoc., Dept. of Chem. Engrg., M.I.T.

Data on Pit Focii—By R. Buehl, Res. Asst., and John Wulff, Assoc. Prof. of Phys. Met., M.I.T.

12:15 P.M.—First Floor (Private Dining Room)
Institute of Metals Division, Executive Committee Luncheon Meeting

Institute of Metals Division

2:00 P.M.—Ball Room

Beneficial Effects of Zirconium in Cast Nickel Silicon Bronzes—By F. R. Hensel, Met. Consultant; E. I. Larsen, Div. Engr.; and A. S. Doty, Met. Engr.; P. R. Mallory Co., Inc.

A Study of the Distribution of Structural and Physical Characteristics Through the Bodies of Large Castings of Gun Metal—By A. A. Bradd, Res. Assoc. in Engrg., Materials Testing Lab., College of the City of New York

A Study of the Distribution of Structural and Physical Characteristics Through the Bodies of Large Castings of Red Brass—By Allen M. Rahm, Res. Assoc. in Engrg., Materials Testing Lab., College of the City of New York

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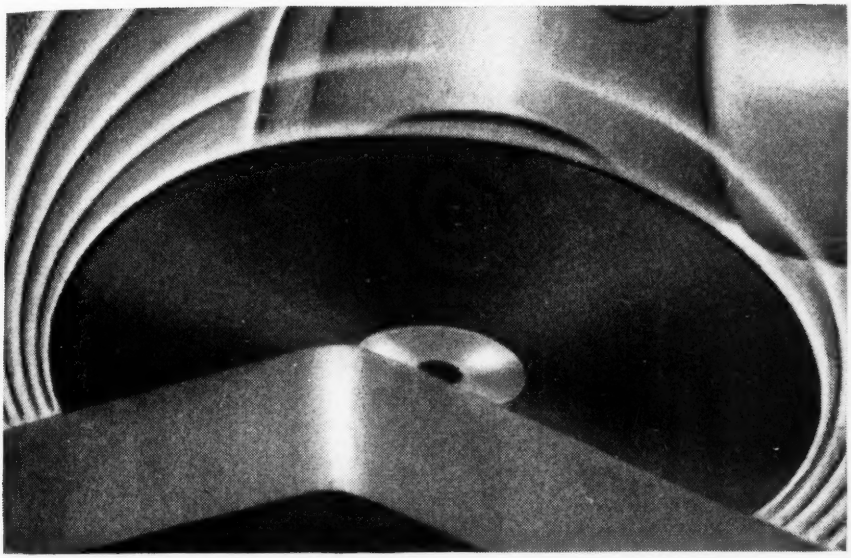

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Iron and Steel Division

2:00 P.M.—Art Floor

Magnetic Analyses of Transformations in a Cold Worked 18-8 Alloy—By R. Buehl, Res. Asst.; and John Wulff, Assoc. Prof. of Phys. Met., M.I.T.

The Carbonalyzer, a New Instrument for the Magnetic Determination of Carbon in a Steel Bath—By H. K. Work, Mgr. of Res. and Dev.; and H. T. Clark, Physicist, Jones & Laughlin Steel Corp.

An Apparatus for Determining the Thermomagnetic Behavior of Slags and Some Preliminary Results Obtained With It—By B. A. Rogers, Senior Met.; and K. O. Stamm, Junior Met., U. S. Bureau of Mines

TUESDAY, OCTOBER 24th

Institute of Metals Division

10:00 A.M.—Ball Room

The Structure of Aluminum After Compression—By Charles S. Barrett, Member of Staff; and Leonard H. Levenson, Res. Asst.; Metals Res. Lab., Carnegie Institute of Tech.

Recrystallization of Lead—By Paul A. Beck, Res. Met., American Smelting & Refining Co.

Iron and Steel Division

10:00 A.M.—Art Floor

The Solubility of Nitrogen in Molten Iron-Silicon Alloys—By J. C. Vaughan, and John Chipman, Prof., Dept. of Met., M.I.T.

Studies of Erosion of Guns—By Peter R. Kosting, Res. Met., Watertown Arsenal

12:15 P.M.—First Floor (Private Dining Room)
Open Hearth Executive Committee, Luncheon Meeting

Institute of Metals Division

2:00 P.M.—Ball Room

The Constitution and Microstructure of Copper-Rich Silicon Copper Alloys—By Cyril Stanley Smith, Res. Met., American Brass Co.

The Alpha Solubility Limit and the First Intermediary Phase in the Copper-Silicon System—By A. G. H. Anderson, Phelps Dodge Corp.

A Simple Method of Thermal Analysis Permitting Quantitative Measurements of Specific and Latent Heats—By Cyril Stanley Smith, Res. Met., American Brass Co.

Iron and Steel Division

2:00 P.M.—Art Floor

Desulphurization of Pig Iron with Calcium Carbide—By C. E. Wood, Acting Supervising Engr.; E. P. Barrett, Met.; and W. F. Holbrook, Asst. Chem.; Blast Furnace Studies Section, Met. Div. Bureau of Mines, Dept. of Interior

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Graphitization of Cementite in Cupola White Iron—By N. A. Ziegler, Res. Met.; W. L. Meinhart and A. J. Deacon, Met. Engrs.; Crane Co.

8:00 P.M.—Main Ball Room

Annual Autumn Dinner of Institute of Metals and Iron and Steel Divisions, Joining with the Chicago Section, A.I.M.E.

Dinner Speaker—C. M. White, Vice President in charge of operations, Republic Steel Corp., Cleveland

WEDNESDAY, OCTOBER 25th

There will be no A.I.M.E. Division sessions Wednesday morning in order to permit members to attend the

CAMPBELL MEMORIAL LECTURE OF THE AMERICAN SOCIETY FOR METALS

12:15 P.M.—First Floor (Private Dining Room)
Iron and Steel Division, Executive Committee Luncheon Meeting

Institute of Metals Division

2:00 P.M.—Ball Room

Tensile Properties of Rolled Magnesium Alloys, I. The Binary Alloys with Aluminum, Antimony, Bismuth, Cadmium, Copper, Lead, Nickel, Silver, Thallium, Tin, and Zinc—By John C. McDonald, The Dow Chemical Co.

Copper Embrittlement, IV—By L. L. Wyman, General Electric Co.

The Effect of Composition Upon the Physical and Chemical Properties of 10K Gold Alloys—By Tracy C. Jarrett, Asst. Met., Res. Dept., American Optical Co.

CONVENTION PROGRAM OF AMERICAN WELDING SOCIETY

Technical Sessions at the Stevens Hotel

MONDAY, OCTOBER 23rd

Morning—9:30 A.M.

Keynote Address — Presentation of Medals

TECHNICAL SESSION

Chairman, H. C. Boardman, Chicago Bridge and Iron Co.
Vice-Chairman, C. A. McCune, Magnaflux Corporation.

Government Construction Work

Welded Structures Under the Bureau of Yards and Docks, U. S. Navy,
Commander C. A. Trexel, Bureau of Yards and Docks, Navy Department

Bonneville Dam Presents Varied Use of Welding,
Paul L. Heslop and Fred T. Downing, Corps of Engineers, U. S. Army

Motion Picture on Grand Coulee Dam

Afternoon—2:00 P.M.

SIMULTANEOUS TECHNICAL SESSIONS

INDUSTRIAL RESEARCH

Chairman, G. F. Jenks, Col., Ordnance Dept., U. S. Army
Vice-Chairman, C. H. Jennings, Westinghouse Electric & Mfg. Co.

Some Aspects of the Welding of Alloy Steels,
H. J. French and T. N. Armstrong, International Nickel Co.

An Investigation of the Spot Welding of Automobile Grade Mill Steel,
W. F. Hess and R. A. Wyant, Rensselaer Polytechnic Institute

Failure of Aluminum Subjected to Combined Stresses,
Joseph Marin, Rutgers University

Fatigue Tests of Welded Joints in Structural Plates,
W. M. Wilson and A. B. Wilder, University of Illinois

PRODUCTION WELDING IN LIGHT GAGE MATERIAL

Chairman, R. E. McFarland, Western Elec. Co.
Vice-Chairman, E. A. Balsley, Link Belt Co.

Welding Tubing for the Automotive Industry,
G. C. Gridley, Universal Joint Co.

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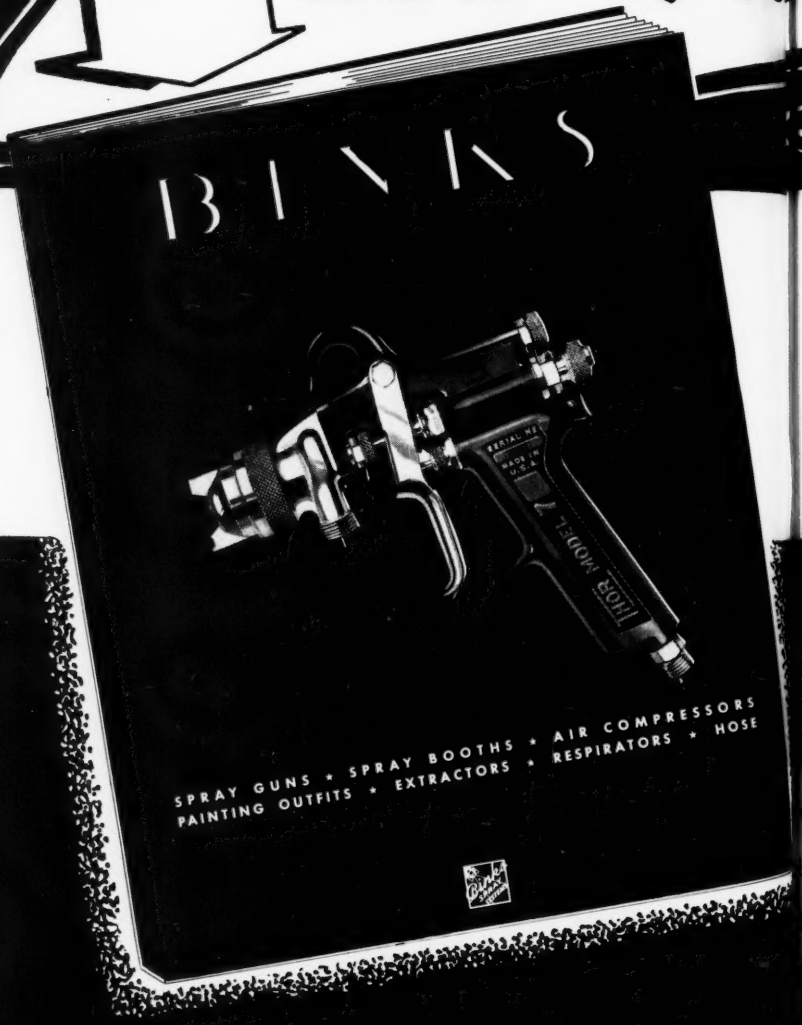

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Joseph C. Lewis, Associated Engineers, Inc.

Automatic Oxyacetylene Welding of Oil Floats,
H. E. Lerner, Taylor Sales Engineering Co.

Evening—7:30 P.M.

Industrial Research Conference—Col. G. F. Jenks, Chairman Presiding

TUESDAY, OCTOBER 24th

Morning—9:30 A.M.

SIMULTANEOUS TECHNICAL SESSIONS
FUNDAMENTAL RESEARCH

Chairman, J. J. Crowe, Air Reduction Sales Co.
Vice-Chairman, Milton Male, U. S. Steel Corp. of Delaware

Application of Proximity Effect to Welding, E. Bennett, Univ. of Wisconsin

Arc Welding in Controlled Atmospheres....G. E. Doan, Lehigh University

The Effect of Alloying in Metallic Arc Welding,
R. W. Emerson, Westinghouse Elec. & Mfg.

The Effect of Flux Upon Grain Size in Welding Mild Steel,
Herman Granberry, Texas Technological College

Creep Tests of Arc Welded Low Carbon Steel,
N. F. Ward, University of California

MACHINERY CONSTRUCTION

Chairman, A. E. Gibson, The Wellman Eng. Co.
Vice-Chairman, C. M. Underwood, U. S. Naval Gun Factory.

Use of Steel Castings and Rolled Steel Plate in Welded Fabrication,
H. J. Shiffli and Emil Krecji, American Steel Fdry.

Paper on Plate Edge Preparation for Welding,

Flow of Materials in Production Welding,
W. W. Petry, Cincinnati Milling Machine

Welding Heavy Presses,
L. J. McDonough and J. R. Henry, Clearing Machine Corp.

Afternoon—2:00 P.M.

SIMULTANEOUS TECHNICAL SESSIONS
FUNDAMENTAL RESEARCH

Chairman, K. L. Hansen, Harnischfeger Corp.
Vice-Chairman, A. M. Candy, Hollup Corp.

Further Studies of the Spot Welding of Low Carbon and Stainless Steels.....W. F. Hess and R. A. Wyant, Rensselaer Polytechnic Inst.

Reactions in Arc Welding,
R. David Thomas, Jr., and F. H. Rhodes, Cornell University

Contact Resistance....F. J. Studer and Mr. Winzenburger, Union College

Weld Inspection by Means of Trepanned Plugs,
W. T. Tiffin, University of Oklahoma

Welding of Copper, A. P. Young, Michigan College of Mining & Technology

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WELDING IN EQUIPMENT CONSTRUCTION

Chairman, J. W. Owens, Fairbanks-Morse Co.
Vice-Chairman, O. T. Barnett, Black, Sivalls & Bryson, Inc.

The Fabrication of Road Building Equipment,
L. L. Burger, LaPlant-Choate Mfg. Co.

Designing Construction Machinery for Production by Welding,
H. C. Hettelsater, Harnischfeger Corp.

Cutting and Welding Stainless Clad Steel,
W. B. Kellor, Ingersoll Steel & Disc Div., Borg-Warner Corp.

Large Equipment Fabrication.....Leslie McPhee, Whiting Corporation

Evening—7:30 P.M.

Fundamental Research Conference—H. M. Hobart, Chairman, Presiding

WEDNESDAY, OCTOBER 25th

Morning—9:30 A.M.

SIMULTANEOUS TECHNICAL SESSIONS

FLAME HARDENING AND HARD SURFACING

Chairman, M. M. Weist, Air Reduction Sales Co.
Vice-Chairman, R. S. Kenrick, The Welding Engineer

Flame Hardening the Way Surfaces of Machine Tools,
Fred C. Dull, The Monarch Machine Tool Company

Hard Facing by Fusion Welding.....T. B. Jefferson, U. S. Engineers

Flame Treating.....J. H. Zimmerman, The Linde Air Products Company

Flame Hardening from the Standpoint of the Commercial Heat Treater.....W. G. Hamilton, Accurate Steel Treating Co., Inc.

RESISTANCE WELDING

Chairman, G. S. Mikhalapov, Heintz Mfg. Co.
Vice-Chairman, D. H. Corey, Detroit Edison Co.

Some Applications of the Resistance Welding Process,
C. L. Pfeiffer, Western Electric Co.

Precision Welding by the Resistance Method,
E. J. Bates and G. J. Oswald, The National Cash Register Co.

Spot Welding of Aluminum.....R. Kauffmann, Aluminum Francais

Some Studies of Flash Welding.....M. G. Yatsevitch, Watertown Arsenal

Afternoon—2:00 P.M.

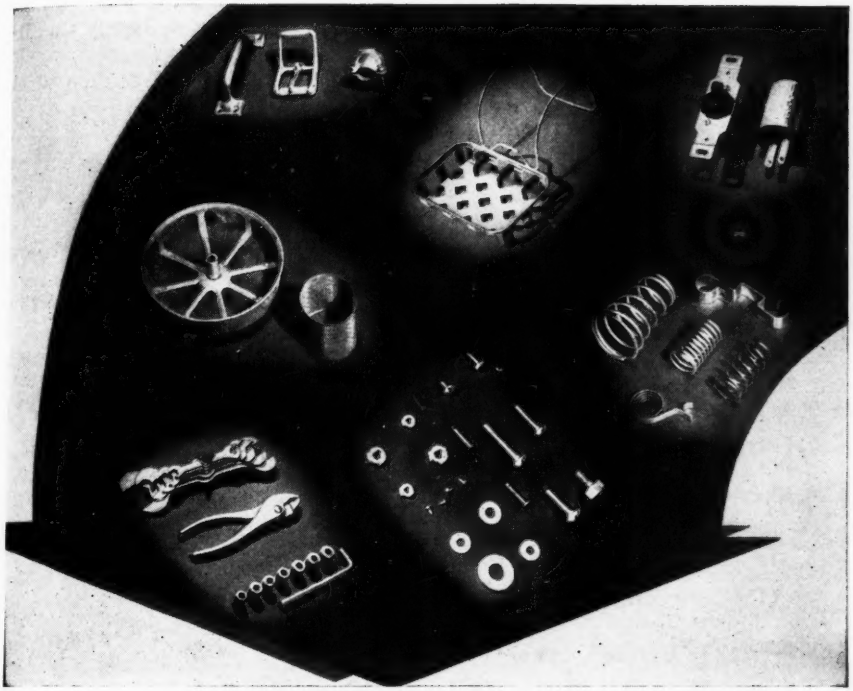
SIMULTANEOUS TECHNICAL SESSIONS

WELDED PIPING, PRESSURE VESSELS AND BOILERS

Chairman, D. S. Jacobus, The Babcock & Wilcox Co.
Vice-Chairman, E. Vom Steeg, Jr., General Electric Company

Welding of Boilers and Pressure Vessels,
R. T. Kernoll, Edge Moor Iron Works

Oxyacetylene Welding of Red Brass Pipe,
A. N. Kugler, Air Reduction Sales Co.



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F. C. Fantz and W. G. Hooper, Midwest Piping & Supply Co., Inc.

Extensions of Fusion Welding in Special Pipe and Pipe Fitting Applications.....E. Hall Taylor, Taylor Forge & Pipe Works

RESISTANCE WELDING

Chairman, J. D. Gordon, The Taylor Winfield Corp.
Vice-Chairman, M. S. Clark, Federal Machine & Welder Co.

Engineering Fundamentals of Resistance Welding,
S. M. Humphrey, Taylor Winfield Corp.

High Speed Welding Assemblies,
E. W. Forkner, Federal Machine & Welder

Application and Use of Portable Spot Welders,
C. E. Heitman, Edward G. Budd Mfg. Co.

Latest Developments in Resistance Welding,
R. T. Gillette, General Electric Co.

THURSDAY, OCTOBER 26th

Morning—9:30 A.M.

SIMULTANEOUS TECHNICAL SESSIONS
CUTTING AND WELDING IN STEEL MILLS

Chairman, L. C. Bibber, Carnegie-Illinois Steel Corp.
Vice-Chairman, H. E. Rockefeller, The Linde Air Products Co.

Repairs to Castings and Other Steel Mill Parts,
S. S. Baumer, Bethlehem Steel Co.

Welding in a Steel Mill.....R. P. Palmer, Wheeling Steel Corp.

Flame Descaling and Flame Cleaning and Dehydrating,
J. G. Magrath, Air Reduction Sales Co.

WELDING IN STRUCTURAL AND SHIP WORK

Chairman, Everett Chapman, Lukenweld, Inc.
Vice-Chairman, A. G. Bissell, Bureau of Construction and Repair, Navy Dept.

High Spots in Ship Welding....E. D. Debes, Bethlehem Shipbuilding Corp.

Designing Welded Frames for Continuity,
By Bruce Johnston and E. H. Mount, Lehigh University

Design and Fabrication of Welded Structures,
C. E. Loos and F. H. Dill, American Bridge Co.

Thirteen Years of Welding Structural Steel,
A. L. Wilson, Mississippi Valley Structural Steel Co.

Afternoon—2:00 P.M.—Committee Meetings; Visit Show

Evening—Annual Banquet

FRIDAY, OCTOBER 27th

Morning—9:30 A.M.

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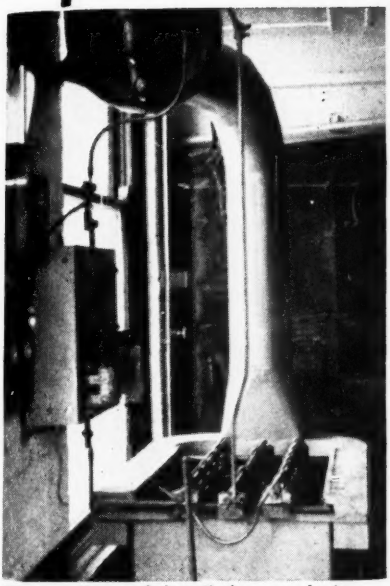
PICKLING and PLATING METHODS



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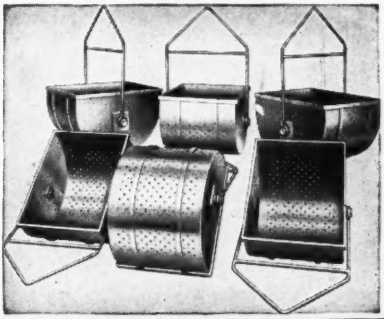

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SIMULTANEOUS TECHNICAL SESSIONS
RAILROAD SESSION

Chairman, P. G. Lang, Jr., The Baltimore & Ohio R. R. Co.
Vice-Chairman, E. Wanamaker, Chicago, Rock Island & Pacific Ry. Co.

Maintenance of Way Welding,
C. E. Morgan, Chicago, Milwaukee, St. Paul & Pacific R. R.

Automatic Welding in the Design and Construction of Railroad Rolling Stock.....F. C. Hasse, Oxweld Railroad Service Co.

Production Spot Welding in the Manufacture of Freight and Passenger Cars.....J. W. Sheffer, American Car and Foundry Company

MISCELLANEOUS SESSION

Chairman, K. V. King, Standard Oil Co.
Vice-Chairman, F. L. Plummer, Consulting Engineer

A Study of Welding Heat Effects,
Dr. W. A. Pearl, Armour Institute of Technology

Welding in the Manufacture of Valves for High Pressures and Temperatures.....W. F. Crawford, Edward Valve & Mfg. Co.

Shrinkage of Steel Due to Welding.....Samuel T. Smetters

11:30 A.M.—Business Meeting

Chairman, H. C. Boardman, President, American Welding Society
Vice-Chairman, G. F. Jenks, First Vice-President, American Welding Society

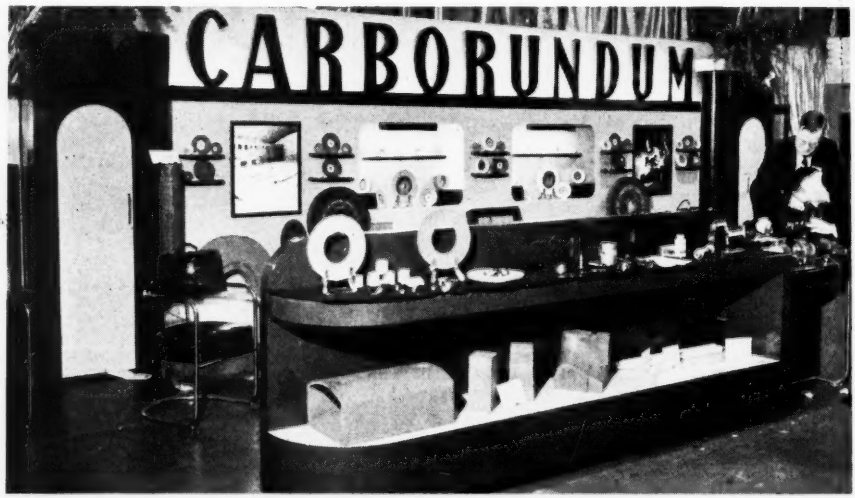
Annual Report of the President

Election and Installation of New Officers

Presentation of Past-President's Plan

Board of Directors' Luncheon Meeting

Afternoon—Inspection Trip, Electro-Motive Corporation Plant, La Grange, Ill.



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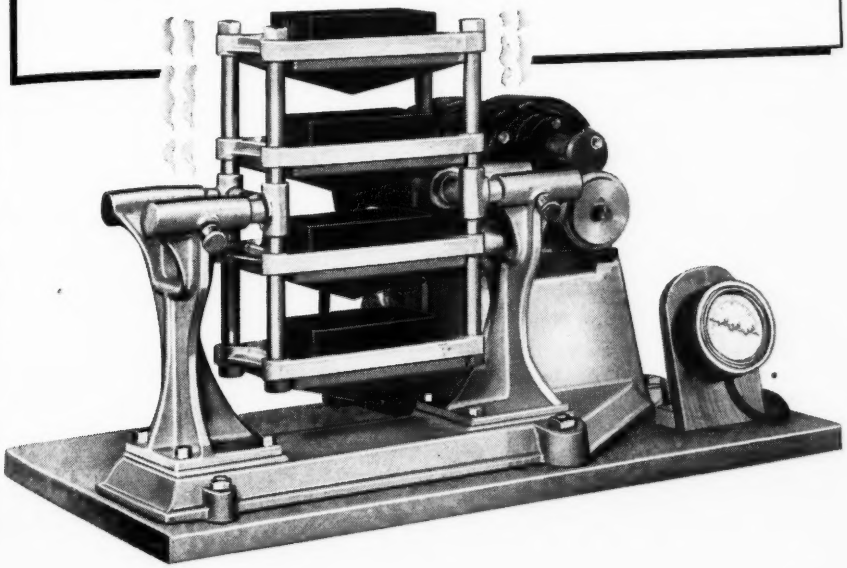

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How does this benefit you? It means that every grain will do its proper share of work. There will be no oversized grains to mar or scratch, no undersized grains or slivers to slow up cutting action. You get a better finish, in less time, at lower cost... *and you get it every time.*

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CONVENTION PROGRAM OF WIRE ASSOCIATION

Technical Sessions at the Congress Hotel

MONDAY

10:30 A.M.—Directors' Meeting

12:00 Noon to 2:00 P.M.—Program — Committee Lunch

Joint Sessions, Both Divisions

"Characteristics of Mild Steel Welding"—J. C. Joublanc, Technical Director, Harnischfeger Corp., Milwaukee, Wis.

"Boulder Dam—the World's Outstanding Transmission Line," a Lecture with Motion Pictures—Dr. Donald M. Simmons, Chief Engr., General Cable Corporation, New York, N. Y.

"Submerged Heat by Submerged Combustion"—Walter S. See, Submerged Combustion Co. of America, Hammond, Ind.

Evening—National Metal Congress

TUESDAY

10:30 A.M.—Ferrous Division:

"Elasticity of Spring Wire"—George Nelson, L. A. Young, Spring & Wire Corp., Detroit, Mich.

"Film Manufacture of Swedish Steel Rods"—Uddeholm Co. of America, New York City

Non-Ferrous Division:

"Coating Wire with Paper Pulp"—J. S. Little, Manufacturing Engineer, Western Electric Co., Kearny, N. J.

"The Brazing of Copper"—L. L. Wyman, Research Eng., General Electric Co., Schenectady, N. Y.

12:00 Noon to 2:00 P. M.—Open
Visit to Hawthorne Works, Western Electric Company, by Both Divisions

Evening—National Metal Congress

WEDNESDAY

10:30 A.M.—Ferrous Division:

"Atmospheric Annealing of Steel Wire"—Dr. A. A. Bates, Manager, Chem-

ical and Metallurgical Division, Westinghouse Electric & Manufacturing Co., E. Pittsburgh, Pa.

"Manufacture and Use of Stainless Steel Wire"—Stanley P. Watkins, Manager, Rustless Iron and Steel Corp., Baltimore, Md.

Non-Ferrous Division:

"Electrical Resistance Wires"—Dr. C. L. Mantell, Technical Director, Wilbur B. Driver Co., Harrison, N. J.

"Manufacture of Wire Solder"—Robert A. Gardiner, President, Gardiner Metal Co., Chicago, Ill.

12:00 Noon to 2:00 P.M.—Wire Association Luncheon

Major General J. O. Mauborgne, Chief Signal Officer, U. S. Army, Guest Speaker

Wire Association Annual Meeting

The Mordica Memorial Lecture

Dr. S. A. Braley, A.B., A.M., Ph.D., Industrial Fellow, Mellon Institute of Industrial Res., Pittsburgh, Pa.

Evening—Smoker

THURSDAY

10:30 A.M.—Joint Session, Both Divisions

Acid Disposal Symposium

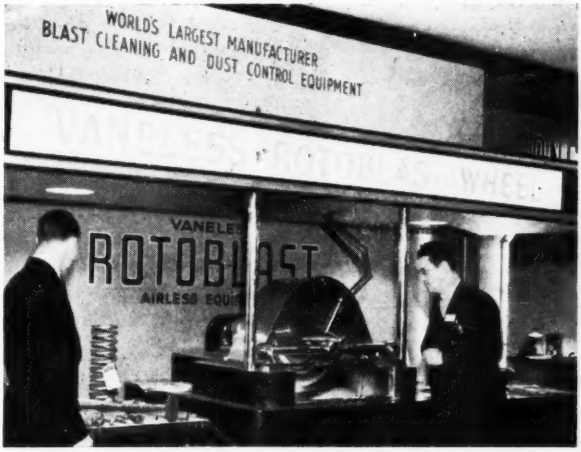
12:00 Noon to 2:00 P.M.—Open

Visit to Republic Steel Corporation Wire Mill — Both Divisions

Evening—American Society for Metals Dinner

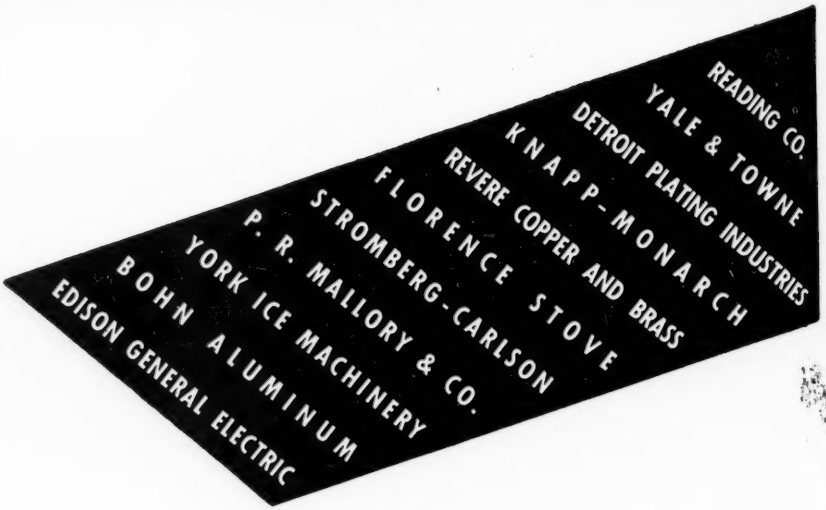
FRIDAY

National Metal Congress Show All Day



EXHIBITS of industrial finishing equipment will be shown under actual operating service conditions at the National Metals Congress and Exposition

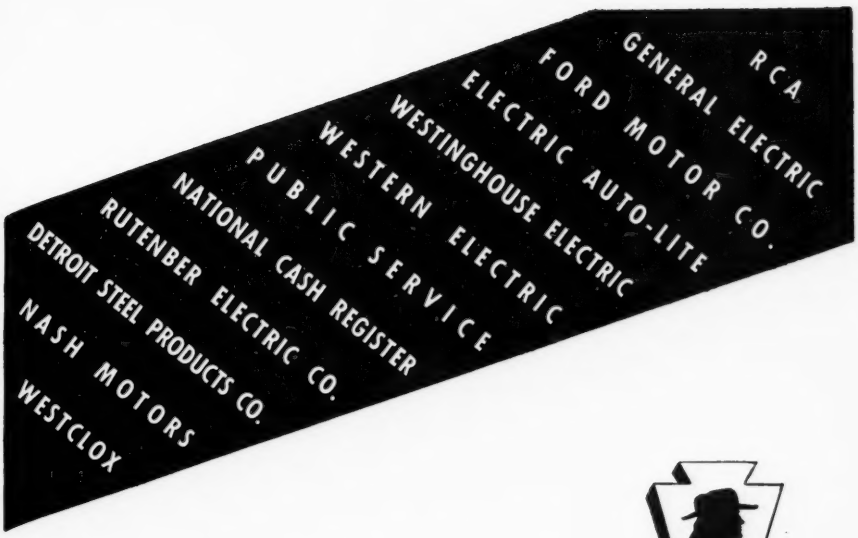
These leading companies entrust difficult metal cleaning problems to the new PENNSALT CLEANERS



JUST three years ago a new heavy-duty metal cleaner was made available. Almost overnight it became famous. It brought startling new speed to difficult cleaning operations, cut through grease and grime, penetrated the dirt, and left the metal surface characteristically bright and clean. Its economy was equally notable, for a small quantity went a long way, and the saving in time was enormous.

This cleaner is known today throughout industry. Its name is Orthosil. Companion cleaners have been developed to meet the diverse and extreme demands of industrial product cleaning. Together with Orthosil they form a complete group meeting every requirement with custom-built precision.

They are the Pennsalt Cleaners for Industry — a new line of metal cleaners with exceptional dissolving and emulsifying action as well as tremendous lasting power.



The Pennsalt Cleaners are new but not untried. They are already in widespread use, as shown by the prominent companies using them — some of whose names you see above. Although their problems differ as widely as their products, which range from silverware to locomotive parts, these famous concerns have had remarkably similar experiences with the new Pennsalt Cleaners. They enjoy uniformly quicker, more thorough cleaning, excellent surface finish, and unusually low cleaning cost.

Why not let us prove these same superiorities to you in your own cleaning operations? Write us for full information on the Pennsalt Cleaners for Industry. Address Dept. P. Pennsylvania Salt Manufacturing Company, Widener Building, Philadelphia, Pa. — New York • Chicago • St. Louis • Pittsburgh • Tacoma • Wyandotte.

Other Pennsylvania Salt chemical products used in large quantity by industry

CHLORINE

ANHYDROUS FERRIC CHLORIDE

SAL AMMONIAC

MINERAL ACID

CAUSTIC SODA

●

PENNSALT

CLEANERS FOR INDUSTRY

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

EXHIBITORS at the NATIONAL METAL SHOW

ACME STEEL CO.
Chicago

Booth K-312

In attendance: A. L. Moll, sales manager, Strip Steel Div.; P. W. Holmes, assistant sales manager, Strip Steel Div.; J. E. Kugelman, sales department; C. S. Henderson, sales engineer; R. F. Main, chief metallurgist; A. G. Hughes, metallurgist; J. A. McCree, service manager; J. M. Williams, assistant service manager; W. Ordway, service department; V. C. Hogren, advertising manager; F. R. Grove, Jr., assistant advertising manager; Chicago Sales Representatives: C. E. Coles and N. C. McNutt, sales department; W. E. Althen and R. S. Fletcher.

Exhibiting (in operation): The Acme Superstrip line of quality strip steels. Various hot and cold rolled parts and finished products in both plain and galvanized finishes will be on display to illustrate just a few of the items which can be manufactured from Superstrip. A sample section of a venetian blind with the slats formed from Colorstrip, the strip steel that is colored before forming, will be shown. Also included will be strip steel with designs rolled-in for use as decorative trim on products such as kitchen utensils, counters, trays, novelties, etc.

AJAX ELECTRIC CO., INC.
Philadelphia.

Booth A-101

In attendance: Dr. G. H. Clamer, president; Wm. Adam, Jr., vice president; John E. Haig, secretary; Ben L. Crew, Chicago representative; J. E. Bullock, Michigan representative; A. A. Anderson and E. E. Bolds, Ohio representatives.

Exhibiting (in operation): Ajax-Hultgren salt bath furnace demonstrating the automatic circulation of the bath produced by the immersed electrodes, and the use of this furnace for carburizing, cyaniding, scale-free hardening, tempering, annealing, and hardening high speed steel tools. Also the recent applications of this salt bath furnace for brazing ferrous and nonferrous assemblies, and its very latest application—heating for forging. Photographic display of recent Ajax-Hultgren salt bath furnace installations, and resistance type heat treating furnaces. Moving pictures showing furnaces in actual use.

AJAX ELECTROTHERMIC CORP.
Trenton, N. J.

Booth A-101

In attendance: G. H. Clamer, president; Dudley Willcox, treasurer and assistant general manager; R. N. Blakeslee, secretary and sales manager; A. D. Meyer, sales metallurgist; G. F. Applegate, superintendent; Frank T. Chesnut, electrical engineer; H. G. Remmers, electrical engineer; T. R. Kennedy, development engineer.

Exhibiting (in operation): Three 3 kw. high frequency converters with demonstration furnaces showing melting and heating. Pictures of operating furnaces for many purposes.

ALOX CORPORATION
Niagara Falls, N. Y.

Booth B-130

In attendance: James E. Shields, research chemist (in charge of exhibit); B. G. Spice, district sales manager, Chicago office; A. W. Burwell, vice president and technical director; W. H. Clark, president.

Exhibiting: Ferrous and nonferrous metal coated with special rust preventive compounds. Various tools, steel balls, assembled ball bearings, precision bars, bar stock all coated with specially designed rust preventive compounds. A new water soluble rust preventive compound will be displayed which is recommended for the protection of sheet metal and for corrosion prevention in aqueous systems. A new nonhydrolizable corrosion preventive lubricating grease designed for ball and roller bearings will be displayed.

New metallic organic soaps will be displayed which are derived from a special manufacturing process in which oxidized petroleum fractions are used.

Special corrosion prevention lubricating compounds will be displayed.

ALUMINUM COMPANY of AMERICA
Pittsburgh

Booth G-201

In attendance: F. L. Gemmer, in charge of exhibit.

Exhibiting (in operation): Display of the com-

mercial forms of Alcoa aluminum alloys available, together with interesting examples of commercial applications of these alloys. Also, a similar exhibit of Mazlo magnesium and its alloys, including examples of commercial applications.

In addition, the exhibit will include three features: 1. In a theater having a capacity of between 40 and 50 seats, there will be a continuous showing throughout the hours of the exhibition of two motion pictures, one following the other. The first, entitled "Mine to Metal," shows all of the steps from extracting the ore to the final pouring of raw aluminum. The second, entitled "Fabricating Aluminum," shows all of the methods used commercially for machining and otherwise fabricating aluminum and its alloys. The length of each picture is approximately 20 minutes.

2. The high speed cutting of Alcoa 11S-T3 alloy rod will be demonstrated continuously on an automatic screw machine, having a spindle speed of 6,000 r.p.m. Stock ½ in. in dia. will be used, giving a surface speed of 785 ft. per minute. Souvenir buttons will be made at the rate of 18 pieces per minute. An additional supply of these buttons will be on hand finished in various colors by the Alumilite-finishing process.

3. The exhibit will also include the first public demonstration of furnace brazing of aluminum. This is a new development in the joining of aluminum, and is applicable to assemblies requiring high speed and relatively low-cost production. Throughout the hours of the show, small assemblies will be brazed in an electric furnace to demonstrate the possibilities of this new method of joining.

AMERICAN MANGANESE STEEL, DIV. of THE AMERICAN BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Ill.

Booth N-311

In attendance: W. G. Hoffman, manager alloy department; E. A. Lerner, assistant to vice president; J. R. Hewitt, metallurgist; John Fellows, metallurgist; H. E. Johnson, engineer; W. G. Atkinson, sales representative; W. C. George, engineer.

Exhibiting: Heat treating containers, such as flexbox parts, carburizing boxes, pans, trays, covers, work-carrying trays, mallableizing boxes.

AMERICAN CAR AND FOUNDRY CO.
New York

Booth C-106

In attendance: F. C. Cheston, sales agent; H. C. Cheston, sales agent, and W. J. Bisset.

Exhibiting (in operation): Six-foot bar heater for heating bars 6 feet long from ⅜ to 1 inch diameter. Heats ½ inch diameter bar 6 feet long in 30 seconds; 1 inch diameter bar, 6 feet long in 75 seconds—to 2,000 degrees Fahr.

No. 2—two-electrode rivet heater for heating rivets ⅜, ½, and ⅝ inch diameter, from ¾ to 6 inches long.

No. 1—one-electrode horizontal "C" heater for spot heats on rounds or flats. Equipped with electric eye for temperature as low as 1,100 degrees Fahr., also equipped with electric time clock to give a soaking heat from split second up, used for heating, normalizing, or hardening.

TRAINED Executives will be present to explain the function of products on exhibition at the National Metals Congress and Exposition

No. 3—one-electrode L/LA forging heater, combination fully-automatic and hand-feed heater.

PAGE STEEL AND WIRE DIV. of AMERICAN CHAIN & CABLE CO., INC.
Monessen, Pa.

Booth M-323

In attendance: V. H. Godfrey, sales representative; E. J. Flood, district sales manager; W. A. Berner, sales representative; W. G. Hoagland, sales representative; W. H. Bleecker, sales manager.

Exhibiting: A complete showing of Page welding wires and electrodes.

THE AMERICAN FOUNDRY EQUIPMENT CO.
Mishawaka, Ind.

Booth L-323

In attendance: Verne E. Minich, president; Otto A. Pfaff, vice president and general manager; Leslie L. Andrus, sales manager; Alden E. Lenhard, advertising manager; Verne Spears, sales department; Robert Orth, sales department; E. A. Rich and E. B. Rich, Chicago sales representatives.

Exhibiting (in operation): 27 x 36 inch Wheelabrator Tumblast, No. 1 Wheelabrator Multi-Tablast, American "Dustube" dust collector.

AMERICAN GAS FURNACE CO.
Elizabeth, N. J.

Booth, Industrial Gas Exhibit

In attendance: P. C. Osterman, vice president; E. C. Cook, G. A. F. Machlet, F. J. Schweizer, J. Mehrman, T. Farwick, Sr., W. J. Barenscheer, O. T. Muehlemeyer, S. C. Dinsmore, S. P. Rockwell, W. A. Stumpf.

Exhibiting (in operation): A wide variety of burners and small appliances, also smaller heat treating equipment which will show just what can be done in the way of small continuous and controlled atmosphere appliances, the same principle being applied to larger equipment of the same type.

A new type of full muffle high speed furnace will be shown for the first time. It will be equipped with flow meters for muffle gas atmosphere control. A small bell type furnace in which the atmosphere is definitely under control for hardening high speed and carbon steels, for carburizing, for nitriding or our new "Ni-Carb" process, also for clean annealing, will be displayed.

A reciprocating full muffle heating machine in which the atmosphere can be definitely controlled for the hardening of a limitless variety of small parts according to the most exacting specifications will be operated.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, INC.
New York

Booth J-320

In attendance: A. B. Parsons, secretary; Louis Jordan, assistant secretary for metals division; Harold A. Maloney, convention secretary; A. C. Carlton, chairman, Chicago section, A. I. M. E., and other officers of the Chicago section.

Exhibiting: The varied fields of the professional activities of mining and metallurgical engineers in the mineral industries and an exhibit of publications.

RIEHLE TESTING MACHINE DIV., AMERICAN MACHINE AND METALS, INC.
East Moline, Ill.

Booth A-117

In attendance: Alfred Sonntag, chief engineer; Owen Kline, sales engineer.

Exhibiting (in operation): Riehle 110-220 foot-pound combination Izod-Charpy-tension impact testing machine. Riehle variable velocity impact testing machine. Riehle production Brinell hardness testing machine. Riehle 60,000 pound Model "505" universal hydraulic testing machine. Riehle 60,000 pound Model P-2 precision hydraulic universal testing machine.

AMERICAN MACHINIST
New York

Booth I-212

In attendance: W. E. Kennedy, manager; E. J. Tangerman, assistant manager; Burnham Finney, editor; R. R. Wiese, Chicago editor; John Haydock, managing editor.

Exhibiting: Copies of *American Machinist* and other McGraw-Hill publications and McGraw-Hill books.

AMERICAN METAL MARKET
New York

Booth K-318

In attendance: S. P. Trench, vice president; R. A. Langer, secretary; S. Glassford, circulation manager; H. W. Shaw, representative.

Exhibiting: Specimen copies of the pioneer daily newspaper of the iron, steel and metal working industries. Established in 1882 as a weekly. Published daily since 1899, publishing daily market reports, prices and news developments affecting the iron, steel and metal fields. An effective advertising medium used by over one hundred important sellers of iron, steel, metals and alloys.

AMERICAN SCREW CO.
Providence, R. I.

Booth E-132

In attendance: H. Mayoh, sales promotion manager; Wm. C. Nelson, Western sales manager.

Exhibiting (in operation): A demonstration of the many advantages of the American Plus Phillips Screws as compared to the many disadvantages of the conventional Slotted Head Screw.

Large white disc on the back panel containing

ANNOUNCING

MICCROLITE

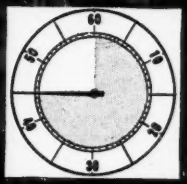
The Perfect Protective Coating for Plating Racks

For Use In ANY SOLUTION OR ACID

FAST DIPPING

This new, all-purpose protective material for plating racks permits the application of extremely thin—yet very effective—coatings. Because of its low viscosity, racks can be dipped five times as fast as with the usual protective coatings. In hand-dipping, a man can pick up an average size rack, dip it, hang it up and reach for the next rack within a period of forty-five seconds. He can apply 500 coats per day, or complete the coating of more than 70 racks. With a dipping machine, his daily output would be considerably greater.

In using Miccrolite, there is no preliminary work other than cleaning the surface to be coated. It is applied directly on the metal surface. No tape or special treatment is required.

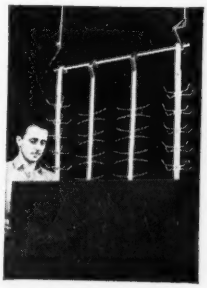


Average Coating Cost Per Rack Is Negligible

FAST DRYING

Miccrolite air-dries much faster than ordinary coatings. The seven coats necessary to prepare the racks for plating use can be applied in one day and the racks can be used the following morning.

Write for Our Completely Descriptive "Miccrolite" Circular.



MICHIGAN CHROME COMPANY

6342 East Jefferson Avenue • Detroit, Michigan

eight translitte photographs that light up consecutively, each illustrating some particular advantage of the screw such as faster driving, better holding power, reduced work spoilage, elimination of accidents, better appearance, etc. A Phillips hand screw driver with a Phillips screw held firmly on its point revolves around the disc pointing to each photograph as it lights up.

Demonstrating unit with a stop watch arrangement conclusively demonstrates the faster driving properties of the American Plus Phillips Products. At the Atlantic City show it definitely proved that Phillips could be driven in half the time of slotted screws.

AMPCO METAL, INC.
Milwaukee

Booth C-118

In attendance: R. W. Uecker, secretary-treasurer; J. D. Zaiser, assistant to general manager; G. K. Dreher, plant manager; W. W. Edens, metallurgist; S. C. Lawson, sales engineer; C. W. Cregier and H. R. Baker, Chicago district representatives.

Exhibiting: Ampco Metal and special nonferrous alloy parts, both rough and finished, as produced by centrifugal casting, sand casting, rolling, forging, hot pressing, and die casting, seven as used by 70 builders of machine tools and machinery as integral parts of their new equipment. Ampco gears and worm wheels of many types for many various applications, wear strips, shifter yokes, cams, rollers, bearings, adjusting nuts and many other miscellaneous applications.

ARCOS CORP.
Philadelphia

Booth L-304

In attendance: R. D. Thomas, president; H. N. Ewertz, sales manager; R. E. Carriat, secretary; R. David Thomas, Jr., metallurgical engineer; K. W. Ostrom, assistant to superintendent.

Exhibiting (in operation): A novel moving display showing the quality of stainless weld metal obtained from electrodes of their manufacture as well as stainless steel products fabricated by arc welding.

Samples showing physical characteristics of the all weld metal and joints made of a wide range of analyses will be on display for close scrutiny. In addition, there will be available complete information on corrosion resistant qualities of Arcos weld metal and also its structure shown by micrographs. Visitors will be interested to see the "weldsculpture" figure of all welded stainless steel fabrication.

ARMSTRONG CORK CO.
Lancaster, Pa.

Booth K-322

In attendance: F. M. Ritts, manager High Temperature Department; C. W. Robinson, manager Chicago office; I. W. Bertelsen, S. M. Jenkins, B. W. Adams, F. W. Muller, J. G. Seanor, W. R. Kerr, technical department

Exhibiting (in operation): Two small furnaces, one constructed of firebrick and the other constructed of Armstrong's Insulating Fire Brick will be operated to demonstrate the properties of the Armstrong product.

The exhibit will include samples of construction using Armstrong's suspended wall and arch design. Full size special shapes in insulating firebrick will be shown.

A photo-mural treatment will be utilized to show a variety of types of installations of Armstrong's Insulating Fire Brick.

Armstrong's ingot insulation will be shown.

AUDUBON WIRE CLOTH CORP.
Philadelphia, Pa.

Booth N-329

In attendance: L. W. Jones, Jr., president; Ray J. Guba, general manager; W. S. Yates, Chicago representative; M. S. Dennett, Detroit representative; L. R. Cartwright, Indianapolis representative.

Exhibiting (in operation): All types and constructions of Metalwove Conveyor Belts and Fabrics for handling a wide range of applications from subzero to high temperature operation up to 2,050 degrees Fahr., in different metals.

Will illustrate the many unique advantages of the Universal, Cord, and Improved Balance Weave Type Belts.

See the 13 feet wide Metalwove Belt in continuous operation.

In addition, a complete range of double crimped women mesh wire cloth in all metals will be exhibited from 6 inches opening to 500 mesh.

AUTOMOTIVE INDUSTRIES
Philadelphia

Booth M-106

In attendance: C. A. Musselman, president; Jos. S. Hildreth, vice president and manager Automotive Division; Herbert Hosking, editor *Automotive Industries;* Jos. Geschelin, Detroit technical editor *Automotive Industries;* Harland E. Boyd, E. E. Elder, John T. Hoole, F. O. Kirkpatrick and A. E. Meanor, sales representatives.

Exhibiting: Automotive Business Publications.

THE BASTIAN-BLESSING CO.
Chicago

Booth I-205

In attendance: E. L. Mills, vice president; H. A. Goodwin, R. A. Johnstone, Frank DeLarzelere and T. F. Wilson, district sales managers; J. C. Owen, assistant sales manager; H. L. Comiskey, Chicago sales representative; N. E. Johnson, sales department; M. H. Wigton, development engineer; F. Windsor, engineer.

Exhibiting (in operation): An active demonstra-

tion of cutting steel with the new Rego KX and KXX Cutting Torches using various fuel gases. Other interesting demonstrations will be made with welding torches showing flame adjustability, welding of white metal and aluminum and an enlightening demonstration of constant gas flow with a two-stage RegOlator. The exhibit will display the full line of Rego Welding and Cutting Apparatus. A daily contest will be conducted with a Rego Torch as a prize. This contest will be open to all visitors at the Rego Booth.

BAUSCH & LOMB OPTICAL CO.
Rochester

Booth D-119

In attendance: I. L. Nixon, manager of instrument sales; M. H. Stevens, assistant manager industrial sales; C. C. Nitchie, sales engineer; H. W. Hollister, manager, Chicago office; J. H. Mead, sales representative, Chicago; H. L. Shippy, sales representative, Detroit.

Exhibiting (in operation): Metallographic equipment, including the research equipment, conveniently arranged for bright field, dark field and polarized light illumination, the standard laboratory type of metallograph and the metallurgical microscope.

Large Littrow type quartz spectrograph, with numerous examples of its use in the analysis of metals, alloys and other industrial materials.

Greenough type Wide Field Binocular microscopes for the three-dimensional examination of materials, small fabricated parts, metal fractures, flaws, etc.

Shop and Brinell microscopes and other optical shop tools.

Large Littrow quartz spectrograph and accessories for the analysis of metals and alloys, with typical examples of its use.

Orthostereoscopic camera and Orthostereoscope for making and viewing three-dimensional photographs at various magnifications.

BETHLEHEM STEEL CO.
Bethlehem, Pa.

Booth L-319

BETHLEHEM

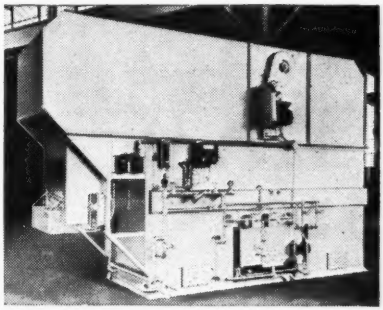
In attendance: R. S. Tucker, manager of sales, alloy steels; L. R. Steuer, manager of sales, carbon bars; D. A. St. Clair, manager of sales, tool steel; E. H. Gumbart, salesman; B. L. Bishop, salesman; H. E. Graffin, Jr., salesman; J. H. Bateman, salesman; R. B. Gerhardt, chief engineer of construction; L. J. Gould, assistant chief engineer of construction; Henry Wysor, metallurgical engineer; W. R. Shimer, metallurgical engineer; P. E. McKinney, metallurgical engineer; E. F. Kenney, metallurgical engineer; L. H. Winkler, metallurgical engineer; A. P. Spooner, metallurgical engineer; J. K. Killmer, metallurgical engineer; G. P.

DETREX means . . .
ENGINEERED QUALITY
in all Cleaning and Finishing Jobs

Whatever your cleaning and handling requirements...whether for hand-operated or completely automatic metal cleaning and finishing equipment...Detrex Engineers will fit your needs, service your equipment, and give you unbiased recommendations.

The one complete source for Solvent Degreasers, Stabilized Safety Solvents, Alkali Washers, Compounded Cleaners and Strippers, Bonderite Equipment, Industrial Ovens, Dip Tanks, Wet Spray Booths, and Wet Spray Booth Compounds.

WRITE FOR FREE DATA OR DEMONSTRATION.



Three-dip conveyorized Detrex Degreaser for cleaning metal parts prior to painting, plating, heat-treating or inspection.

DETROIT REX PRODUCTS COMPANY
13017 HILLVIEW AVE. *Branch Offices in Principal Cities* DETROIT, MICHIGAN

Witteman, metallurgical engineer; F. Aloi, metallurgical engineer; W. C. Clements, metallurgical engineer; J. S. Worth, metallurgical engineer; C. H. Herty, Jr., research engineer; J. L. Gregg, research engineer; S. Epstein, research engineer; W. M. Steinecke, research engineer; Charles Schenck, development engineer; A. C. Chamberlin, research engineer; E. Gurney, metallurgical supervisor; A. F. MacDonald, contact engineer; M. C. McFadden, contact engineer; R. C. Snyder, contact engineer; M. T. Metzger, contact engineer; L. H. Vannatta, contact engineer; K. H. Read, contact engineer; J. A. Chalk, contact engineer; T. Washburn, contact engineer; J. P. Brosnahan, contact engineer; T. D. Shannahan, contact engineer; W. F. Palm, contact engineer; H. R. Dunstan, contact engineer; J. C. Long, manager of publications; S. H. Yorks, A. A. Warg.

CHICAGO

In attendance: John F. Hennessy, manager of sales; C. H. Cecil, J. C. Crook, George Bangart, F. J. Emerick, W. R. Frantz, H. A. Cillis, A. M. Branum, C. R. Vincent, C. E. Owen, L. L. Bassett, salesmen.

LACKAWANNA

In attendance: J. E. Jacobs, assistant to general manager; A. H. Shonkwiler, superintendent, continuous sheet, strip and plate mill; H. C. Harding, superintendent, building and highway specialty shop; H. J. Cutler, engineer of tests; C. R. Perkins, assistant engineer of tests; C. F. Norbeck, chief metallurgist.

CAMBRIA

In attendance: W. C. Frank, chief engineer; R. E. Penrod, engineer of tests; C. T. Ward, superintendent, rod and wire department; S. D. Baumer, superintendent, welding and sheet metal work; J. F. Wilbur, combustion engineer.

Exhibiting (in operation): 1. Six dioramas illustrating the principal physical properties of Mayari R steel: (a) Corrosion resistance; (b) impact strength; (c) fatigue strength; (d) weldability; (e) increased pay load due to higher strength; (f) ease of fabrication. 2. Applications of Mayari R are featured in 32 transparencies covering automotive industries, railroads, mining, ship building, oil fields, bridge construction, road building and excavating. 3. Parts of buses, freight cars and passenger cars, made of Mayari R. 4. Coils of 72 inch strip, hot and cold rolled, with a series of transparencies showing the principal operations in hot and cold rolling. This display also includes a number of stampings showing the deep drawing properties of the strip. 5. A testing laboratory to demonstrate hardenability of alloy steels. This display includes typical parts for which hardenability is a requirement, such as ring gears, drive shafts, and hollow drill steel. Electric furnace operations and electric heat treatment are shown by means of transparencies.

BINKS MFG. CO.
Chicago

Booth C-137

In attendance: J. F. Roche, president; J. F. Roche, Jr., vice president; S. Bramsen, vice president; E. F. Watts, advertising and sales promotion manager; H. Erickson, B. J. Hedger, F. L. Terrill, R. T. Hardy, J. E. Rowe, salesmen.

Exhibiting (in operation): A display of finishing units for all metal products: 1. An automatic reciprocating spray machine for flat ware. 2. An automatic rotary spindle type finishing machine for metal products of all sizes and shapes. 3. A dynaprecipitor spray booth with water wash action to clean spray fumes. 4. A complete line of standard spray guns and all accessories.

BLISS & LAUGHLIN, INC.
Harvey, Ill.

Booth M-305

In attendance: W. R. Howell, president; C. L. Huff, vice president and sales manager; G. A. Spaulding, vice president; T. D. Taylor, R. C. Spencer, G. R. Caskey, F. J. Robbins, W. J. Jabsen, M. H. Townsend, metallurgical engineers; S. M. Cyganek, screw machine engineer.

Exhibiting: Cold finished bar steels and shafting—carbon and alloy.

THE BRISTOL CO.
Waterbury, Conn.

Booth L-325

In attendance: H. L. Griggs, vice president and sales director; L. G. Bean, sales manager; H. E. Beane, field sales manager; Roy M. Walker, Chicago district manager; W. F. Emery, sales engineer; C. A. Teeple, sales engineering department; C. R. De Arman, sales promotion department; A. J. Reiber, mill supply sales representative.

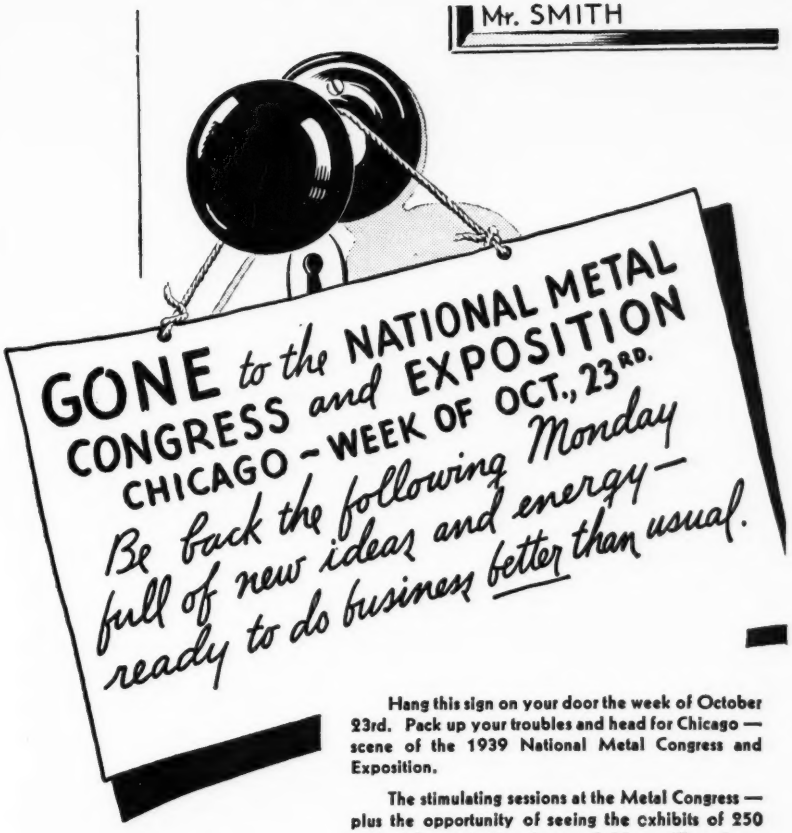
Exhibiting (in operation): Control instruments and featuring proportioning pyrometer control—both air and electric as applied to heat treating temperatures. The instruments being exhibited include:

Pyromaster: a round-chart proportioning potentiometer controller with separable compact units, electrically connected and which are not in constant motion—in fact there is no motion at all until a change in temperature occurs. This instrument's unusual resistance to vibration will also be demonstrated.

Wide-Strip Pyrometer Controller, a strip-chart proportioning controller with dust-proof galvanometer precision—another feature of these instruments contributing to fine performance.

Rockwell-Bristol Dilatometer, a device with furnace, supporting frame and recording instrument for studying—during heating and cooling cycles—the expansion and contraction characteristics of ferrous and nonferrous metals, as well as ceramics and other materials of rigid form. The recording instrument is a Pyromaster which gives two chart records—one of temperature-dilatation and one of time-dilatation.

Ardometer Radiation Pyrometer Controller.


Mr. SMITH
GONE to the NATIONAL METAL CONGRESS and EXPOSITION
CHICAGO - WEEK OF OCT., 23RD.
Be back the following Monday
full of new ideas and energy —
ready to do business better than usual.

Hang this sign on your door the week of October 23rd. Pack up your troubles and head for Chicago — scene of the 1939 National Metal Congress and Exposition.

The stimulating sessions at the Metal Congress — plus the opportunity of seeing the exhibits of 250 industrial organizations in your field — will send you home full of new ideas and energy — ready to do business *better than usual.*

You'll enjoy the contacts with other men in your industry, too. They'll be streaming into Chicago from all over the country — 20,000 strong — to attend this great annual event.

You had better make your plans now. For full particulars, contact any of the technical societies listed at the left, — or address W. H. Eisenman, Director, National Metal Congress and Exposition, 7016 Euclid Avenue, Cleveland, Ohio.

Co-operating Societies:
Wire Association;
American Society for Metals;
Institute of Metals Division and
Iron and Steel Division of A.I.M.E.;
American Welding Society.

National
METAL CONGRESS *and* **EXPOSITION**
INTERNATIONAL AMPHITHEATRE
CHICAGO ..... Oct., 23-27, 1939

Flow Ratio Controller, with device for changing ratio, adjustable from outside the case.

Low Range Draft Controller.

Pyrotrol Controller, a safety device for gas-fired ovens and furnaces.

THE BROWN INSTRUMENT CO.
Philadelphia

Booth D-123

In attendance: E. B. Evleth, vice president and general manager; L. Morton Morley, vice president and general sales manager; R. L. Goetzenberger, vice president; K. R. Knoblauch, sales engineer, Philadelphia; C. L. Saunders, sales engineer, Chicago; O. B. Wilson, sales engineer, Chicago; R. R. West, sales engineer, Chicago; J. A. Robinson, sales engineer, Chicago; G. W. Brown, sales engineer, Chicago; R. A. Weikel, sales engineer, Philadelphia; C. L. White, sales engineer, Detroit; C. N. Sherwin, sales engineer, Detroit; K. L. Wilson, sales engineer, Indianapolis; R. H. Perry, sales engineer, Cleveland; D. W. Choate, sales engineer, Milwaukee; I. K. Farley, sales engineer, St. Louis.

Exhibiting (in operation:) Indicating, recording, controlling instruments and auxiliary equipment used in the production, fabrication and heat treatment of both ferrous and nonferrous metals.

The exhibit will include a "Leaders of Industry" display listing 55 plants in which 3,391 Brown Potentiometer Pyrometers are measuring and controlling temperatures with laboratory accuracy.

Instruments for automatically controlling the temperature of electrically heated and oil or gas fired furnaces will be demonstrated. These will include electrically and pneumatically operated thermometers for die casting machines, ovens, tempering tanks and other services up to 1,200 degrees Fahr. —also electrically and pneumatically operated control potentiometers for use with thermo-couples or radiation pyrometers for hardening, brazing and annealing furnaces or other services up to 3,400 degrees Fahr.

The following instruments will be in operation: Brown Thermometers and Pressure Gages: An entirely new and improved line of temperature and pressure recorders, indicators and controllers in a modern, streamlined, rectangular case—styled by Henry Dreyfuss, designer of the "Twentieth Century Limited."

Advanced design includes new, powerful, flat spiral actuating elements of bronze or of alloy—heat treated to insure permanent accuracy and long life. A scientifically controlled method of winding the spiral insures accurate calibration. Ample pen torque is provided without sacrificing speed of response.

Brown Multiple-Recording Potentiometer Pyrometer: This system operates on the Wheatstone Bridge Principle, producing a control characteristic in which the position of the motor or motor valve is dependent upon the amount of deviation of temperature from the control setting.

Brown Proportioning Control Potentiometer Pyrometer: This system operates on the Wheatstone Bridge Principle, producing a control characteristic in which the position of the motor or motor valve is dependent upon the amount of deviation of temperature from the control setting.

Brown Analy-Graph: Self-contained system for analyzing and measuring furnace atmosphere. It provides the heat treater with reliable and permanent means of determining, selecting and maintaining the proper furnace atmosphere for any metal at any temperature.

Brown Protectoglo System: A combustion safeguard demonstration of the utilization of the electrical conductivity of the flame itself giving positive protection against flame failure.

CAMBRIDGE WIRE CLOTH CO.
Chicago

Booth C-103

In attendance: Fred L. Hooper, assistant to president; F. L. Stevenson, Detroit engineer; Don Stanberg, Chicago engineer.

Exhibiting: A complete line of metal conveyor belts, high temperature mesh baskets, wire tiles, dipping baskets, heat and corrosion resisting screen.

Will feature full size photographs of metal conveyor belt installations in copper brazing furnaces, hardening furnaces, bright annealing furnaces, silver soldering furnaces, tempering furnaces, quench tanks, galvanized spangling conveyors, etc.

CENTRAL SCIENTIFIC CO.
Cleveland

Booth M-315

In attendance: S. R. Evans, sales manager; Walter L. Long, sales engineer; Ralph Crume, sales engineer; John Dudycha, sales engineer; Dr. M. N. States, director of research.

Exhibiting (in operation): Some recent developments in the field of chemical laboratory equipment of interest to steel chemists will be displayed. We will have in operation the Cenco "Photelometer," a development in the field of photoelectric instruments which is now effecting a considerable saving in time in many chemical procedures, particularly molybdenum in steel.

CHICAGO STEEL FOUNDRY CO.
Chicago

Booth C-105

In attendance: David Evans, president; C. M. Evans, secretary; E. R. Dougherty, sales manager; Wm. E. Adams, superintendent; Julius Roeder, metallurgist; Tom Busack, chemist; C. K. Garrison, assistant superintendent; Jas. P. McKeon, salesman; Geo. M. Porn, salesman; Patrick Gleeson, purchasing agent.

Exhibiting: Heat and corrosion resisting alloys.

THE CLEVELAND QUARRIES CO.
Cambridge, Md.

Booth A-138

In attendance: E. A. Burr, vice president; H. G. Leibold, service engineer; P. J. May, service engineer; F. G. Metzger, service engineer; L. M. Spencer, salesman; R. P. Haynes, salesman; J. H. Hopp, salesman; C. L. Stewart, salesman.

Exhibiting: A full line of samples of Buckeye Silica Firestone for lining the following will be on exhibit: cupolas, soaking pits, mixers, acid tanks, drop forge bottoms, air furnace bottoms, blast furnace car ladles, and Bessemer converters. We will also show motion pictures depicting quarrying and fabrication of firestone of various grades. Small models of soaking pits and other vessels lined with stone will be shown.

CLIMAX MOLYBDENUM CO.
New York

Booth L-334

In attendance: M. Schott, president; J. B. Thorpe, vice president; C. M. Loeb, Jr., vice president; T. D. Parker, T. W. Hardy, A. J. Herzig, F. L. Woodside, R. M. Parke, V. A. Crosby, E. R. Young, G. O. Loeffler, J. E. Wilson, D. R. Carse, H. E. Hostetter, T. E. Norman, P. M. Snyder, J. F. Robb, A. Linz.

COLUMBIA TOOL STEEL CO.
Chicago Heights, Ill.

Booth K-313

In attendance: T. G. Dougal, Chicago district sales manager; T. L. Haines; G. H. Lawrence; C. F. Scheid, Milwaukee district sales manager; A. W. Mierow; S. E. Sjogren, Detroit district sales manager; A. M. Walstrom; A. H. Priebe; R. Sjogren; G. C. Beebe, Cleveland district sales manager; W. J. Sonderman; G. H. Kaiser; F. A. Terry, Cincinnati district sales manager; C. C. Jackson; E. P. Tenpound; A. T. Clarage, president; R. M. Sandberg, general manager; A. M. Steever, general superintendent; A. J. Scheid, metallurgical engineer.

Exhibiting (in operation): Full information on and specimens of Clarite high speed, Vanite high speed, Molyite high speed, Maxite super high speed, Superdie high carbon, high chromium, Oil-die non-deforming, Exl-Die non-deforming, Buster alloy punch and chisel, Special, Extra Vanadium, Extra, Waterdie, Standard Vanadium and Standard tool steel.

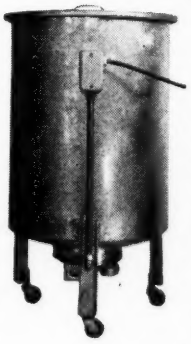
COMPRESSED INDUSTRIAL GASES, INC.
HOLLUP CORP.
Chicago

Booth N-331

COMPRESSED INDUSTRIAL GASES, INC.

In attendance: C. T. Price, general manager and

New PHILL-CO *portable* Degreaser



MODEL 110
Size 36" x 22"
110 volts A.C.

The Solution to Your Degreasing Problems!

*PHILL-CO degreasers will remove oil and grease from all types of Metal—rapidly and economically, without Labor or Mechanical action.

SIMPLE Operation by means of hot vapors which are non-inflammable. Solvent reclaimed and distilled within machine.

NO INSTALLATION REQUIRED—Plug into any electrical outlet and you are ready to degrease. Take PHILL-CO portable degreaser to the job—instead of taking the job to the degreaser. SAVE unnecessary waste of time.

MODEL 220—POWER DRIVEN FLUSHER—The larger units, also portable, are furnished with a power driven flusher for flushing off sand and road dirt from engines and other parts that may have heavy deposits of dirt. PHILL-CO degreasers are electrically heated and controlled.

One gallon of PHILLSOLV will clean from 1 to 3 tons of work.

See Actual Demonstration at Our Booth—N-302
(National Metal Exposition)

For full particulars write:

PHILLIPS MANUFACTURING CO., 340 W. Huron, Chicago

*A FEW CHOICE LOCALITIES AVAILABLE FOR DISTRIBUTORS

vice president; Fred Wyman, general sales manager; R. G. Wilson, assistant general sales manager; W. R. Hinkle, Chicago district sales manager; J. F. Olson, service engineer; R. Metcalf, salesman; A. C. Brown, research engineer.

HOLLUP CORPORATION

In attendance: T. S. Wright, general manager; O. L. Howland, sales manager; H. F. Zeigler, assistant sales manager; A. M. Candy, consulting engineer; R. P. Monroe, sales engineer; G. O. Rohder, sales engineer; F. J. Cusson, industrial engineer.

Exhibiting (in operation): Compressed industrial gases, oxygen, acetylene and hydrogen; Automatic cutting machine; Victor oxygen, acetylene apparatus; Hollup electrodes; welding machines; and welding equipment and supplies.

CONTINENTAL INDUSTRIAL ENGINEERS, INC.
Chicago

Booth, Industrial Gas Exhibit

In attendance: W. A. Darrah, president; E. B. Jones, chief engineer; R. R. LaPelle, chief estimator; Jeanne Darrah, advertising manager; H. C. Armin, eastern manager; S. A. Grayson, English manager; C. C. Miller, Detroit manager; O. W. Andersen, western manager; R. A. Hastings, assistant to the president.

Exhibiting (in operation): A muffleless gas carburizing furnace showing that material can be carburized in a gas atmosphere without any deposit or scale on the metal. Samples of the case depth obtained with this carburizing method will be available.

A small working model of a large size industrial installation of a muffleless gas curburizer. The principles of this large industrial installation will be demonstrated.

A new design of radiation-convection glass annealing lehr which has revolutionized the possibilities of glass annealing. This design involves principles of heat application that are very efficient and effective and heretofore were thought to be impossible in the lehring of glass articles.

Top Hat annealing furnace is a new design with a working installation that has shown excellent results. This furnace looks much like the conventional bell type annealing furnace but has a new radiation-convection principle of burner application which has entirely eliminated alloy firing tubes. In addition to this new burner setup the results obtained have shown an evenness of heat distribution that heretofore was apparently only obtainable with electric elements for heat source.

An automatic case hardening furnace using a cyanide bath. This installation eliminates the human element in obtaining a trouble-free case hardening. A recirculating annealer which shows the principles of operation of this type of annealing which was originated by the Continental Industrial Engineers, Inc., several years ago.

A new design of continuous strip coating of steel. This particular installation is used for the coating of steel with either cadmium, lead, or tin.

An oxygen detector which is used in various types of installations throughout industry where a small amount of oxygen present in any given gas is immediately detected and electrical circuits energized to bring about any reaction which we may desire. To our knowledge this is the first instrument of this kind ever introduced into industry.

CROWN RHEOSTAT & SUPPLY CO.
Chicago

Booth L-329

In attendance: G. A. Spencer, president; G. E. Huenerfauth, vice president; L. J. Morper, secretary; Fred P. Green, W. G. Meggers, C. E. Clindinin, George Yochim.

Exhibiting (in operation): Slow speed method of polishing. New style laminated cylinder. Rheostats. Centrifugal dryer.

DAYTON ROGERS MFG. CO.
Minneapolis

Booth M-303

In attendance: Strutz & Mead, Milwaukee, sales engineers; H. D. Carroll, Chicago, sales engineer; T. A. Bell, Indianapolis, sales engineer; W. R. Overstreet, Kansas City, sales engineer; D. A. Rogers, Minneapolis, sales manager.

Exhibiting: Display of representative metal stampings produced by short-run method. Complete display of Universal Pneumatic Power Press Cushion Equipment—(die cushions). These die cushions are being shown for the first time. They are designed particularly for difficult forming operations and deep drawing, requiring rigid and extreme ring holding pressure, and accurate alignment for both stripping and difficult ejecting operations.

A. P. de SANNO & SON, INC.
Phoenixville, Pa.

Booth N-312

In attendance: V. Colajezzi, engineer; B. G. Hardy, engineer; Arthur E. Petersen, vice president; Norbert Conway, Jr., advertising manager; S. M. Hershey, technical service; E. J. Rohan, sales; W. K. Whelan, sales.

Exhibiting (in operation): Radiac abrasive cut off machines. Radiac abrasive cut off disks. Radiac abrasive grinding wheels. Radiac electric industrial grinder. Radiac abrasive mounted points and stones.

DETROIT TESTING MACHINE CO.
Detroit

Booth A-113

In attendance: Fred H. Nass, Ralph Campbell.

Exhibiting (in operation): New 60,000 pound capacity Universal Testing Machine.

New long stroke (18 inch) Brinell machine with stationary table. No screw adjustment.

Improved Direct Reading Brinell guaranteed to

stand up under severest production conditions. No grinding or glass reading.

Improved Hand Operated Brinell for high grade laboratory or percentage testing.

Improved large capacity Sheet Metal or Ductility tester.

HARRY W. DIETERT CO.
Detroit

Booth B-119

In attendance: H. W. Dietert, president; E. E. Woodliff, sales manager; John Schuch, spectroscopist; Carl King, test engineer; Frank Valtier, mechanical engineer.

Exhibiting (in operation): Modern analysis equipment consisting of quick carbon and sulphur determinators, spectrographic equipment for qualitative and quantitative analysis of metals, immersion pyrometer for molten metals, sand testing equipment, and 3,000 degrees Fahr. combustion furnaces.

THE DOW CHEMICAL CO.
Midland, Mich.

Booth M-302

In attendance: L. B. Grant, manager Dowmetal sales; W. R. Caple, E. R. Turnquist, G. C. Brown, J. C. Mathes, J. C. H. Stearns.

Exhibiting: Dowmetal magnesium alloys, such as sand castings; permanent mold castings; die castings; forgings; extruded shapes, bars, rods and tubes; and plate, sheet and strip.

THE DURALOY CO.
Scottdale, Pa.

Booth N-301

In attendance: T. R. Heyward, Jr., president; W. F. Furman, vice president; H. T. Harrison, general manager of sales; F. B. Cornell and C. Knappenberger, Detroit; D. J. Marsden, New York; H. R. McCrea and E. R. Doud, Pittsburgh.

Exhibiting: Centrifugally cast screw conveyor; normalizing furnace dry shaft; furnace trays; centrifugally cast tubes; centrifugally cast rollers; special furnace rail; furnace door; furnace fingers; and special castings.

THE ELECTRIC FURNACE CO.
Salem, O.

Booth I-202

In attendance: R. F. Benzinger, president; F. T. Cope, general manager; A. H. Vaughan, chief engineer; C. L. West, vice president; K. U. Wirtz, C. H. Vaughan, N. H. Knowlton and H. C. Jurs, sales engineers; G. P. Lozier, superintendent; S. J. Eberwein, assistant superintendent; B. C. Thompson, Detroit district representative; A. E. Wright, advertising manager.

Exhibiting: Photographs of recent furnace installations and latest developments in special atmosphere equipment for copper brazing, scale-free

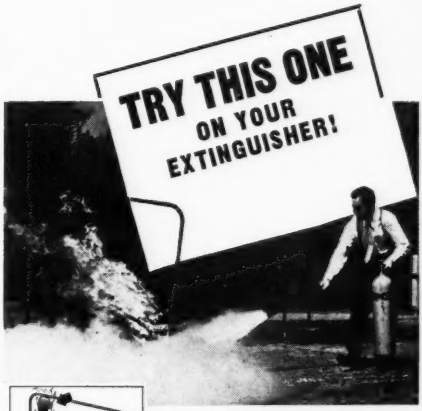


Diagram shows how fire was set up. Gasoline flowing from leaking pail... flame cascading down drainboard...spill fire blazing on ground.

LUX Killed It In 7 Seconds!

Kill blazes with the fastest known extinguishing agent. LUX extinguishers kill fires quickly...thoroughly...safely. LUX carbon dioxide gas is brutal to fire, harmless to everything but fire.

For Your Severe Fire Hazards

If your fire hazards include flammable liquids or electrical equipment, LUX protection is your one best answer. Keep LUX portables near at hand. Or, if the hazard is intense, concentrated, let us tell you about the LUX Built-In System, automatically or manually controlled.

Safe-Harmless

Photo shows new Kidde-LUX Model Two, one-handed, trigger-control extinguisher.

Walter Kidde & Company
1031 West Street, Bloomfield, N.J.

– Please send your new booklet, "Don't Play With Fire," describing LUX portable extinguishers and the new Kidde-LUX.

Name.....

Address.....

City.....State.....

heat treating, and bright annealing ferrous and nonferrous products including wire, sheet, tubing, strip, stampings, bolts, and automotive parts, also samples of material treated in these furnaces.

Exhibit also includes photographs of outstanding electric, oil and gas fired furnaces built for normalizing, carburizing, short cycle malleableizing, nitriding, forging, enameling, annealing and other heat treating processes, also pictures of gas fired radiant tube furnaces, and Elfurno special atmosphere generators.

FEDERAL PRODUCTS CORP.
Providence

Booth K-307

In attendance: F. C. Tanner, sales engineer; I. A. Hunt, manager, sales and advertising department; Wallace E. Carroll, Chicago agent; E. W. Goodwin, Chicago agent.

Exhibiting (in operation): Dial indicators: Universal, regular and super-sensitive types.

Dial indicator gages: Cylinder, caliper, comparators, depth, grinding (Arnold), internal, pitch, small hole, snap (adjustable), thickness, thread and special gages, etc.

A. FINKL & SONS CO.
Chicago

Booth C-132

In attendance: W. F. Finkl, president; J. C. Vance, sales manager; J. W. Moffatt, Chicago representative; E. H. Graham, Detroit sales manager; W. L. Graham, Cleveland representative; J. H. Wilson, Cincinnati representative; W. H. Rieger, Pittsburgh representative; H. Berg, New England representative; T. Ledin and Albert Finkl, metallurgists.

Exhibiting: Exhibit of new and improved type of die blocks for drop forging—Grade "Cuprodie."

FIRTH-STERLING STEEL CO.
McKeesport, Pa.

Booth C-101

In attendance: D. G. Clark, vice president; A. B. Corbin, sales manager; M. F. Judkins, engineer Firthite Division; A. R. Zapp, manager Firthaloy department; O. K. Parmiter, metallurgical engineer; R. T. Riffle, advertising manager; E. T. Jackman, Chicago manager; R. G. Bright, E. T. Breaddus, C. E. Hughes and Alan Jackman, sales engineers; A. F. Lind, Firthite engineer; G. E. Moote, C. W. Nitchie, H. J. Rodibaugh, L. S. Russell and N. N. Shephard, sales engineers.

Exhibiting: Firthite Sintered Carbide lathe tools; milling cutters; end mills; boring tools; counterbores; drills; reamers; tipped gages. Firthaloy Sintered Carbide dies and mandrels. High speed steel tools including shape hole drills; drill rods of various shapes. High production dies of Cromovan. Parts made of Firth-Sterling stainless steel will be on display in booth.

FISHER SCIENTIFIC CO.
Pittsburgh

Booth M-308

In attendance: A. W. Fisher, vice president; H. W. Koch, sales manager; W. B. Warren, director of development.

Exhibiting (in operation): Latest developments in grinding and polishing equipment for metallography, a new instrument, the carbonanalyzer, for the rapid magnetic determination of the carbon content of open hearth steels, and a demonstration of the F. & F. High Speed Optical Pyrometer.

FOOTE BROS. GEAR AND MACHINE CO.
Chicago

Booth B-135

In attendance: H. G. Hobbs, sales manager, steel specialties division; G. Anderson; A. Mackman, M. M.; F. Salzban, and J. Rasau, estimators; R. K. Plummer, W. G. Kerr, and R. J. Beler, sales representatives; H. V. Greenwood, R. J. Brennan, Kenneth Grant, and J. S. Roney, city salesmen.

Exhibiting: Exhibit will consist of fractured test specimens of "Five-Point" Deephard Steel and "Five-Point" Deephard Steel special alloy with charts and graphs illustrating the physicals and other data obtained from tests conducted with samples.

In addition there will be finished products on display.

THE FOXBORO CO.
Foxboro, Mass.

Booth K-305

In attendance: J. J. Burnett, manager Chicago office, M. A. Schreiner, J. C. Fryer and O. R. Prescott, sales engineers; S. C. Horn, manager pyrometer division; C. E. Helenberg, manager Detroit office; E. R. Huckman, manager St. Louis office; A. B. Bates, manager Cleveland office; H. L. Lee, sales engineer.

Exhibiting (in operation): The new potentiometer recorder controllers. Also air-operated potentiometer controller, Stabilog potentiometer controller, Rotax temperature controller, indicating and recording gages, pickling tank control—air and electric operated valves.

GENERAL ALLOYS CO.
Boston

Booth F-205

In attendance: H. H. Harris, president; G. C. McCormick, vice president; N. L. Smith, assistant to president; W. R. Blair, engineer; J. J. Donovan, Western sales manager; T. E. Franks, Chicago sales representative; H. G. Chase, Ohio district manager; A. L. Grinnell, Detroit repre-

sentative; G. O. Desautels, Indianapolis representative; H. W. Reynolds, Cleveland representative; A. H. Valentine, Dayton representative; William McArdle, St. Louis representative; Walter Gerlinger, Milwaukee representative; L. J. Edwards, New England representative; A. E. Painter, New York representative; R. E. Chew, V. P. Ladd Equipment Co., Pittsburgh representative; R. E. Lynd, Buffalo representative.

Exhibiting: Nickel-chromium alloys, Q-Alloys; carburizing and annealing containers; cyanide and lead pots, furnace hearths, roller rails, heat and acid resistant chain; cyanide dipping baskets, recuperators, miscellaneous furnace parts, parts for every type heat treating furnace—carburizing, annealing, normalizing, hardening, tempering, forging, spheroidizing; tubes and retorts, corrosion and abrasion resistant castings.

GENERAL ELECTRIC X-RAY CORP.
Chicago

Booth A-120

In attendance: J. H. Clough, president; W. S. Kendrick and J. B. Wantz, vice presidents; G. E. Happe, A. C. Baldwin, engineers; J. Sullivan, sales; A. E. Gathman, sales manager; F. E. Scheven, factory manager; J. Thelen and G. E. Wantz, supplies; G. E. Simons, sales promotion; R. A. Mills, sales; C. H. Wantz, convention manager; E. W. Page, manager industrial department; H. I. Trenary, Richard Holste, Paul Freer, Richard Landis and P. H. Reynolds, engineers; L. L. Kahl, chief electrical engineer.

Exhibiting: The new precision-built Model XRD will be the central feature of the exhibit. This model is a compact, versatile, safe apparatus for application of X-ray diffraction methods to a multitude of industrial and research problems. The unit is completely new in design, offering outstanding advantages never before embodied in such an apparatus, while retaining the best features of older designs. In addition to the diffraction unit, illuminated radiographs and diffraction patterns will be displayed.

CLAUD S. GORDON CO.
Chicago

Booth A-113

In attendance: C. S. Gordon, president; A. W. Anderson, vice president; C. O. Anderson, manager Cleveland office; S. A. Silbermann, manager Indianapolis office.

Exhibiting (in operation): "Sel-Car" for selective carburizing and for prevention of decarburization in heat treatment and protection of parts against oxidation.

No. 1100 Furnace—portable, electric furnace for temperatures up to 1,100 degree Fahr. Size: Pot 6⅜ x 5⅝ inches.

Cinch Steel Cement for cementing high speed steel and stellite to carbon steel tool bases.

Oven for low temperature drawing and annealing.

GREENLEE FOUNDRY CO.
Chicago

Booth E-125

In attendance: M. A. Scott, sales manager; L. B. Harkrider, sales department; A. P. Alexander, assistant metallurgist; S. P. Bazeluk, chemist.

Exhibiting (in operation:) Meehanite castings, also one small laboratory electric furnace with which we will oil quench and harden small pieces of Meehanite.

GROB BROTHERS
Grafton, Wis.

Booth J-308

In attendance: Benjamin Grob and Theodore Grob, co-partners; Oscar P. Brett, Mrs. O. P. Brett and Walter Dvorak, exclusive representatives.

Exhibiting (in operation): Die making machines, band saws, and filing machines.

HANDY & HARMAN
New York

Booth E-107

In attendance: A. W. Swift and T. H. Gallagher, salesmen, Chicago office; F. C. Jones, New York office; Leo Edelson, engineer, New York office; Fred Petrie, work laboratory, Bridgeport, Conn.; F. T. Van Sychel, New York office, (in charge of booth).

Exhibiting (in operation): A high speed production brazing job will feature our exhibit—refrigerator valve parts will be joined with Easy-Flo Brazing Alloy and Handy Flux at high speed and low cost. The outstanding features of our silver brazing alloys, Sil-Fos and Easy-Flo, will be emphasized on an illuminated background and by a large collection of samples. The reasons why Handy Flux should always be used with these alloys will be demonstrated. At another demonstration table the uses of these alloys in joining all sorts of metals will be carried on continuously. A separate show case will show silver clad metals and other forms in which silver is used in industry.

CHARLES HARDY, INC.
New York

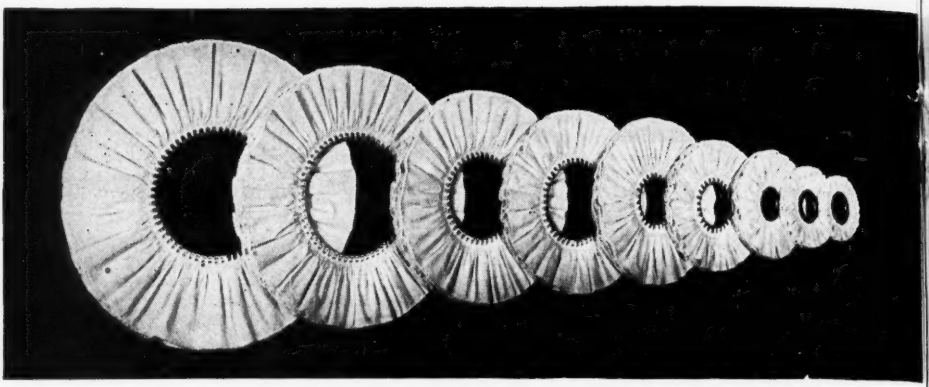
Booth B-108

In attendance: R. L. Patterson, vice president, Hardy Metallurgical Co.

Exhibiting (in operation): Metal powders and alloy powders. Products fabricated from metal powders including bearings, friction clutches, magnets, tool steels, stainless steels, gears.

Hardy-Lepel high frequency furnace lately developed for the sintering of metal powder products. This is the first time that such equipment has been demonstrated for powder metallurgical applications.

AIRWAY *Ventilated* BUFFS



A TYPE FOR HIGH SPEED—SEMI OR FULL AUTOMATIC—OR HAND POLISHING

Permanent tapered spindle adapters supplied on all small sizes for use on tapered spindles.

5 FEATURES "AIRWAY" COOLING

1. Permits 50% to 100% higher speeds.
2. Faster cutting and does not ridge the work.
3. Eliminates burning.
4. Raveling eliminated, requires no raking.
5. Saves compound.

Made in all grades of cloth. Only bias material used. Available diameters 5" to 18".

Use half as many sections.
Wears twice as long.
Costs half as much.

JACKSON BUFF
21-03 41st AVENUE

S AIRWAY *Ventilated* BUFFS

VENTILATION

The AIRWAY BUFF is used with metal center plates and flanges so arranged as to allow the centrifugal action of the buff to draw air in at the sides of the wheel and pump it out radially between the buff sections. This circulation of air through the AIRWAY keeps it cool under most severe operating conditions, entirely eliminates burning and thus prolongs the life of the buff. This permits 50% to 100% higher speeds.

COMPOUND SAVING

The bias construction of the AIRWAY eliminates ravel and wasting of buff as well as compound.

The ventilating feature keeps the buff cool and reduces the tendency of the compound to melt and be thrown off.

The AIRWAY should not use more than 50% of the compound used with a conventional buff.

OTHER ADVANTAGES

The AIRWAY requires no raking, has a very fast cut and does not ridge the work. It is clean because there are no cross threads to pull out and the composition stays on the buff.

It has a wide face and usually two sections are equivalent to four of the conventional buffs. This should be considered when comparing prices with conventional buffs.

WARNING NOTICE

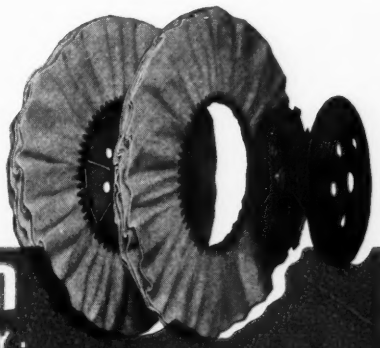
Jackson Buff Corporation of Long Island City, New York, has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air-cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect these rights and to stop infringement.

MATERIAL USED

Special sheeting used for cutting or coloring as your requirements demand. All bias cut, no ravel, no waste, no dirt.

Center plates and flanges made to suit the customer's spindle diameters.

Write us direct for samples or get in touch with a Licensed Jobber or Distributor.



F CORPORATION
LONG ISLAND CITY, N.Y.

HEAT TREATING AND FORGING
Pittsburgh

Booth E-104

In attendance: D. N. Watkins, president; N. R. Moll, vice president in charge of sales; H. M. Reich, Western manager; T. B. Little, Eastern manager; F. B. Yeager, field contact representative; Charles Longenecker, managing editor; W. C. Kernahan, editor.

Exhibiting: Magazines.

HEVI DUTY ELECTRIC CO.
Milwaukee

Booth K-319

In attendance: E. L. Smalley, president; H. E. Koch, vice president; Melville Lowe, metallurgist; G. A. Chutter, Eastern district manager; J. S. Ayling, Cleveland district manager; S. A. Silbermann, Indianapolis district manager; A. H. Oberndorfer, advertising manager; Bazel Walsh and Norman Bloye, sales engineers.

Exhibiting (in operation): Electric heat treating furnaces.

HOLCROFT & CO.
Detroit

Booth B-121

In attendance: C. T. Holcroft, president; R. T. Cadwell, secretary-treasurer; W. H. Holcroft, vice president; C. H. Martin, Chicago representative; C. L. Joy, sales engineer; J. H. Bradley, chief draftsman; J. A. Dow, J. T. Jans and D. A. Blair, sales engineers; G. C. Wilsher, B. E. French and G. P. Stark, field engineers.

HOLLUP CORP.
Chicago

Booth N-331

See compressed Industrial Gases, Inc.

CHARLES A. HONES, INC.
Baldwin, N. Y.

Industrial Gas Exhibit

In attendance: C. A. Hones, president; W. R. Hones, vice president; C. J. Hones, secretary; W. F. DeVoe, sales engineer; B. L. Finn, Chicago representative.

Exhibiting (in operation): Semi muffle oven furnace, full muffle high speed oven furnace, pot furnaces, industrial gas burners operating on city gas pressure.

E. F. HOUGHTON & CO.
Philadelphia

Booth M-311

In attendance: G. W. Pressell, executive vice president; C. G. Schultze, assistant general sales manager; D. J. Richards, sales manager, Western and Central divisions; H. E. Martin, Detroit sales manager; A. A. Miller, Chicago sales manager; D. C. Miner, advertising manager; J. McElgin, metallurgical engineer; Reese Nelson, L. B. Morrell, W. McManus, H. J. Fletcher, B. B. Mason and J. E. Allison, Chicago sales representatives.

Exhibiting (in operation): Liquid carburizing bath—operating with Perliton No. 45, a new Perliton development for faster penetration of carbon at short heat for production run of small parts.

A new nonburning carburizer—"Nu-Carb." A blackening salt—Houghto-Black. A new series of straight cutting oils and bases—Cut-Max—which will handle 90 per cent of all machining needs. A new alkaline cleaner for cleaning oil quenched work—"Houghto-Clean 145-S." A new lead pot covering and insulator for heads and risers of castings—Lapix.

ILLINOIS TESTING LABORATORIES, INC.
Chicago

Booth I-210

In attendance: J. A. Obermaier, president; M. D. Pugh, sales manager; D. L. Humm; W. J. Bailey; W. G. Buck.

Exhibiting (in operation): Portable and wall type indicating pyrometers, electric thermometers, indicating controllers, metal detectors, direct reading air velocity meters.

INDEPENDENT PNEUMATIC TOOL CO.
Chicago

Booth M-326

In attendance: N. C. Hurley, Jr., vice president; W. A. Nugent, vice president; N. C. Hurley, president; R. G. Faverty, district manager; F. Schiel, P. Swearingen, H. Maiwurm, R. P. Kellen, F. C. Davis, J. B. Caswell, T. Seward and J. O'Leary, sales department; H. J. Schultz, manager contract department; G. V. Theurer, manager order department; E. J. Krug, order department; E. F. Slattery, sales department; J. V. Trojan, office manager; J. A. Lind, auditor; C. W. Jacobsen, order department.

Exhibiting (in operation): Thor portable electric drills, screw drivers, nut setters, hammers, sanders, polishers, grinders, saws, and tapers.

INDUSTRIAL PUBLISHING CO.
Cleveland

Booth J-326

In attendance: I. B. Hexter, president; L. P. Aurbach, vice president.

THE IRON AGE
New York

Booth M-325

In attendance: F. J. Frank, president; J. H. Van Deventer, editor; C. S. Baur, general advertising manager; T. W. Lippert, metallurgical editor; W. F. Sherman, Detroit editor; T. C. Campbell, Pittsburgh editor; C. E. Wright, managing editor; W. A. Phair, associate editor; R. E. Miller, machinery editor; F. J. Oliver, associate editor; Emerson Findley, Central Western manager; B. L.

Herman, Philadelphia manager; H. K. Hottenstein, Western manager; Peirce Lewis, Detroit manager; C. H. Ober, New York manager; W. B. Robinson, Pittsburgh manager; D. C. Warren, New England manager.

Exhibiting: Current copies of *The Iron Age*.

THE J. W. KELLEY CO.
Cleveland

Booth L-308

In attendance: J. W. Kelley, president; A. F. Ruffner, metallurgist; D. V. Kennedy, B. O. Platell, M. W. Woodman and L. S. Wright, sales representatives.

Exhibiting (in operation): A complete display of heat treating products.

THE C. M. KEMP MFG. CO.
Baltimore

Industrial Gas Exhibit

In attendance: E. B. Dunkak, vice president; R. S. Van Note, assistant sales manager; Wm. Hunt, development engineer; W. S. Bassett, Chicago sales engineer; Messrs. Beltaire, Drissen, Detroit sales engineers; W. C. Green Co., Cincinnati sales engineer; B. L. Ashdown, St. Louis sales engineer.

Exhibiting (in operation): Submerged gas burners for liquid heating and evaporating. Recirculating radiators for furnace heating. Immersion melting unit for soft metals. The Atmos-Gas Producer for bright annealing. The Industrial Carburetor for efficient gas application.

KROPP FORGE CO.
Chicago

Booth K-334

In attendance: R. A. Kropp; R. B. Kropp; C. F. Johnson; Arthur Hellstrom; Carter Lestine; L. Ruchti; Richard Joernberg; James Sweeney; R. McElligott; J. H. Lund; Guy H. Rumpf.

Exhibiting: All classes of forgings.

KROUSE TESTING MACHINE CO.
Columbus, O.

Booth J-310

In attendance: G. N. Krouse, president; J. P. Krouse, engineer.

Exhibiting (in operation): High speed, large rotating beam fatigue machines with wire testing adapters. High speed, small rotating beam fatigue machines with wire testing adapters. Sheet and plate fatigue machines with corrosion fatigue attachments. High temperature fatigue machines.

LA SALLE STEEL CO.
Chicago

Booth J-304

In attendance: T. L. Kelly, H. E. Mack and T. S. See, vice presidents; M. N. Landis and H. N.

HAYNES SUPERIOR FINISHES

PERSPIRATION PROOF CLEAR LACQUER No. 46-76

- Thins equal parts.
- Lower in cost, yet higher in quality than competitive products.
- Spray or dip to metal.
- The best dipping lacquer we have seen, leaves no drops even on unusual shaped articles, perfect flow.
- Used extensively on compacts, cigarette cases, flashlights and jewelry.

ULTRAKOTE GLOSS SYNTHETIC No. 46-78

A high bake, non-yellowing porcelain-like finish. Resists heat and is excellent for space heaters, stoves and electrical appliances.

Is used by many of the outstanding concerns in the country, because they proved it was the best they could buy.

BLACK LACQUER No. 46-77

- Costs no more than a cheap varnish.
- Thins equal parts.
- Perfect adhesion to any metal.
- Can be had in flat or semi-gloss.
- Particularly suited to hardware.
- A rich finish at low cost.

If any of the materials fit into your production, why not take the credit for improving your company's finish and saving them money. Send for a sample.

C. W. HAYNES LABORATORIES, Inc.
50 CHANDLER STREET SPRINGFIELD, MASS.

Landis, metallurgists; R. G. Taylor, engineer; W. M. Croxton, J. S. Hickey, E. J. James and H. L. Chapin, sales representatives; L. B. Evans, advertising manager; H. K. Howe, assistant to vice president and in charge of exhibit.

Exhibiting (in operation): Exhibit will feature Stressproof Steels, an amazing development in high strength, free machining, nonwarping steel bars with unique wearability. Practical demonstrations of characteristics of Stressproof Steels will be in operation and a complete display of sample applications will be shown.

Also new developments in cold finished carbon and alloy steel bars will be exhibited.

LEEDS & NORTHRUP CO.
Philadelphia

Booth J-313

In attendance: G. W. Tall, manager, industrial sales division; A. F. Moranty, district manager, industrial division, Cleveland Office; A. E. Tarr, district manager, industrial division, Chicago office; T. C. Smith, market extension division; H. Brewer, manager, market extension division; O. Brewer, district manager, Philadelphia industrial division; W. R. Schofield, chief engineer; J. W. Harsch, assistant chief engineer; T. C. Bennett, industrial division, Chicago office; J. H. Brewer, industrial division, Chicago office; L. H. Coleman, industrial division, Chicago office; H. F. Coyle, industrial division, Chicago office; A. A. Degling, industrial division, Chicago office; A. F. Gallistel, industrial division, Chicago office; E. B. Howes, industrial division, Chicago office; W. D. Trueblood, industrial division,, Chicago office; R. L. Wham, industrial engineer, Chicago office.

Exhibiting (in operation): Various models of Micromax pyrometers, for use both with thermocouples and with Rayotubes. Exhibited for the first time is the new L&N optical pyrometer—a completely new instrument, not a redesign. Besides measuring directly in degrees, this instrument has many important features which increase accuracy of measurement and convenience of operation.

An outstanding demonstration of the micro-responsiveness of Micromax, with particular reference to its remarkable effect on automatic control. Hardening and tempering furnaces and a unique demonstration of the various controls effected by the new Homocrab Carburizing Method.

LINCOLN ELECTRIC CO.
Cleveland, O.

Booth H-205

In attendance: J. F. Lincoln, president; A. F. Davis, vice president; C. M. Taylor, general sales manager; G. E. Tenny, manager Chicago office; V. Peters, welding technician; J. C. Ardagh, H. M. Downing, W. B. Horton, L. W. O'Day, G. T. Mann, E. A. Hess, W. I. Miskoe, sales engineers; F. C. Archer, manager Milwaukee office.

Exhibiting (in operation): New and improved arc welding generators and a number of new arc welding electrodes.

A 200-ampere vertical welding machine, a 200-ampere special belted unit, a handy-sized 150-ampere machine fitted with the Lincoln "Dual Continuous Control" and a special gasoline engine driven welder.

New Lincoln electrodes which extend the range of useful application for arc welding by making it possible to arc weld new metals, or obtain a certain type of deposit not available heretofore, include "Fleetweld 10" electrode which provides full slag coverage and exceptional smoothness for finish beads; "Stainweld C," which is a modification of the well known 18-8 analysis—18-8 SMO—suitable for welding stainless steels of types 316-317 (Iron and Steel Institute); "Inconweld" for arc welding nontarnishing alloys of 80% nickel, 14% chromium and 6% iron such as Inconel; "Readyweld," for use with alternating current transformer type welders which have low open circuit voltage; "Hardweld 50," for building up steel parts and surfaces to resist deformation and wear; "Surfaceweld," a fine grained alloyed powder, for providing a smooth, dense abrasion resisting surface, to be applied with the carbon arc.

A demonstration of the arc welding of various ferrous and nonferrous metals with the latest model "Shield-Arc" welder, showing the many advantages of "Dual Continuous Control" of welding voltage and current.

The welding of light gage tubing at high speed by the "Electronic Tornado" process of automatic carbon arc welding also will be shown.

Latest developments in arc welding accessories and supplies.

LINDBERG ENGINEERING CO.
Chicago

Booth F-202

In attendance: A. N. Lindberg, president; L. A. Lindberg, secretary; F. A. Hansen, vice president; C. H. Stevenson, vice president; L. C. Koenig, superintendent; L. H. Remiker, chief engineer; L. A. Shea, Chicago sales representative; L. W. Hayden, New York district manager; J. S. Ayling, Cleveland office; C. P. Critzer, Cleveland office; F. J. Condit, Detroit district manager; H. O. Munn, Buffalo district manager; C. F. Burling, service engineer; R. C. Onan, advertising manager.

Exhibiting (in operation): Cyclone tempering furnace, Tubulaire electric furnaces and Hydryzing process for hardening tools and dies. Also a demonstration of bright hardening of springs and stampings, by means of Hydryzing process.

MACHINERY
New York

Booth J-322

In attendance: H. Bradley, field manager; E. K. Hammond, advertising representative; D. Cook,

advertising representative; Erik Oberg, editor.

Exhibiting: Machinery Magazine, Engineering books.

MAGNETIC ANALYSIS CORP.
Long Island City, N. Y.

Booth J-314

In attendance: W. S. Gould, Jr., vice president; F. O. Fischer, sales and service engineer; J. D. Wilfong, Jr., sales and service engineer; V. L. Spoley, sales and service engineer.

Exhibiting (in operation): A Magnetic Analysis equipment for the inspection of steel for mechanical, physical, and chemical properties.

A demagnetizing equipment for the demagnetization of ferrous material.

MAGNAFLUX CORP.
New York and Chicago

Booth C-119

In attendance: A. V. de Forest, president; F. B. Doane, vice president; C. A. McCune, secretary; C. E. Betz, technical director.

Exhibiting (in operation): Magnaflux method of inspection, which is a nondestructive and rapid method for determining defects in steel and steel parts, will be demonstrated on the latest designed Magnaflux units as employed in the automotive, aircraft, railroad and welding industries as well as in all general industrial fields. Various specimens from all of these industries will be exhibited.

MAHR MANUFACTURING CO., DIV. OF DIAMOND IRON WORKS, INC.
Minneapolis

Booth A-119

In attendance: L. J. Reay, president; W. G. Barstow, vice president; C. F. Olmstead, sales manager; C. W. Rudolph, Chicago district representative; G. B. Duff, New York district representative; A. F. Tenney, metallurgist; A. J. Nordenson, sales engineer.

Exhibiting (in operation): Mahr nitrogen generator in operation with gas analyzing equipment for determination of purity. Also display of various metal specimens and samples treated under nitrogen protective atmosphere with supplementary photographic display of heat treating equipment.

P. R. MALLORY & CO., INC.
Indianapolis, Ind.

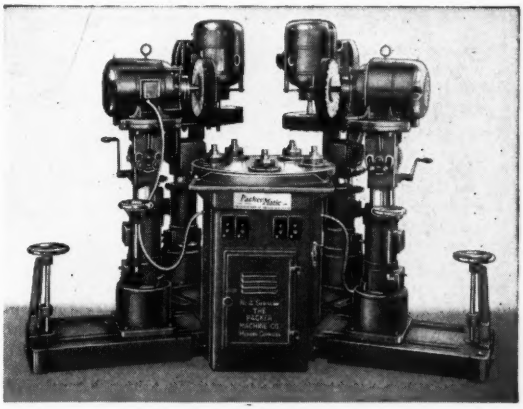
Booth K-320

In attendance: J. A. Weiger, vice president; J. D. Tebben, sales manager, metallurgical division; Clifton Taylor, manager, foundry products division; F. R. Hensel, metallurgical consultant; P. N. Cook, advertising manager; F. L. Damarin,

Packer-Matic
Automatic
POLISHING & BUFFING MACHINES

Progressive Manufacturers alert to the many advantages and cost saving value of Automatic Polishing and Buffing look to PACKER-MATIC to cut hourly costs and increase their production. The PACKER - MATIC shown is the New No. 4 Rotary-5 Station Machine — also made in Straight Line Conveyor, Double Roll and Vertical Portable Types.

Actual "Time Study" on Your Product gladly made without obligation. SEND Sample and Finish desired.



THE PACKER MACHINE CO.
MERIDEN, CONN., U. S. A.

Chicago district sales manager; E. F. Allison, Chicago district salesman.

Exhibiting: A complete exhibit of parts made from Mallory nonferrous alloys, including all sizes and types of spot welding tips, seam welding wheels, flash, butt, and projection welding dies, water cooled holders, and many miscellaneous products, such as flat springs, backings, bushings and bearings.

Also a complete showing of Mallory electrical contacts of tungsten, silver, molybdenum, Elkonite and special alloys for every type of service. Circuit breakers and other apparatus showing Mallory contacts in use will be featured.

New products on display will include universal offset and ejector types of water-cooled holders for spot welding tips, and a new tip dresser.

MANGANESE STEEL FORGE CO.
Philadelphia

Booth N-329

In attendance: L. W. Jones, Jr., president; R. J. Guba; W. S. Yates, Chicago representative; M. S. Dennett, Detroit representative; L. R. Cartwright, Indianapolis representative.

Exhibiting: Will exhibit and demonstrate the extreme abrasive and wear resistant qualities of Rol-Man True 11-14% manganese steel in rolled, pressed, and forged shapes as well as the new type Rol-Man Weld-lock screens for sizing and separation of abrasive material.

The exhibit contains specifications of pins, bushings, bolts, forgings, wear plates, Rol-Man welding rods, and welded products. Also samples of used parts illustrating the abrasive wear resisting characteristics of Rol-Man manganese steel.

METAL & THERMIT CORP.
New York

Booth D-129

In attendance: J. B. Tinnon, sales manager; J. H. Deppeler, chief engineer; M. L. Smith, advertising manager; C. P. Young, Chicago manager; H. T. Thompson, Pittsburgh manager; John Plaskon, G. O. Forseth, J. C. Honhart, E. J. Knapp, representatives.

Exhibiting (in operation): The complete line of Murex electrodes for electric arc welding will be displayed, as well as examples of products made by electric welding. Demonstrations of arc welding will be given. Equipment for welding by the Thermit process will be shown together with typical repairs made by Thermit welding. In addition, samples of various metals and alloys produced by alumino-thermic reduction will be exhibited.

METALS AND ALLOYS
New York

Booth K-315

In attendance: H. W. Gillet, editorial director; E. F. Cone, editor; F. P. Peters, assistant editor; P. H. Hubbard, publishing director; W. P. Winsor, business manager; G. E. Cochran, Western manager; F. T. Enright, district manager, Cleveland; Lue Stearns, district manager, New England.

Exhibiting: "Metals and Alloys," the magazine of metallurgical engineering. Also, technical books.

THE MIDVALE CO.
Nicetown, Philadelphia, Pa.

Booth E-118

In attendance: Stuart Hazlewood, vice president in charge of sales; H. H. Ziesing, general sales manager; F. J. Sleath; W. B. Smyth, district sales manager, Cleveland; A. O. Schaefer, engineer of tests; F. B. Foley, superintendent of research; J. R. Adams, superintendent of special products; J. C. Glass, district sales manager, Chicago; J. Baer; H. S. Garrett, district sales manager, Pittsburgh.

MODERN MACHINE SHOP and PRODUCTS FINISHING
Cincinnati, O.

Booth E-119

In attendance: Don G. Gardner, publisher; H. Campbell, editor (MODERN MACHINE SHOP); F. W. Vogel, managing editor (PRODUCTS FINISHING); J. M. Krings, advertising manager; G. M. Fillmore, Eastern manager; J. Vander Voort, Eastern representative; G. H. Meyers, Western manager; G. E. Hay, Central Western manager; G. J. Schwarber, service manager, and N. S. Rogers, art director.

Exhibiting: Displays featuring the two publications, MODERN MACHINE SHOP and PRODUCTS FINISHING.

MOLYBDENUM CORP. OF AMERICA
Pittsburgh

Booth H-211

In attendance: Van Rensselaer Lansingh, vice president; W. H. Phillips, vice president in charge of sales; Earl Steward, Western district sales manager; N. F. Tisdale, sales engineer; Marx Hirsch, president.

Exhibiting: Chemicals of molybdenum, tungsten and boron. Molybdenum and tungsten metal powders. Molybdenum oxide in metal containers. (The new way to add moylbdenum to steel.)

NATIONAL CYLINDER GAS CO.
Chicago

Booth A-126

In attendance: Jim Lacey, general sales manager; Jack Adank, assistant general sales manager; Chet Mott, manager equipment division; George Ricker, torchweld factory manager; Cliff McGuinn, assistant district sales manager; Jerry Jensen, M. Whaley, K. Schattel, H. Newcom, L. Bordeau, equipment division; Jim Wilson, Tom Galvin, Art Dedi, R. Howe, R. Pursel, S. Rowland, E. Turk, Ben Haley, gas division.

Exhibiting (in operation): National's new No. 5 portable cutting machine will demonstrate bevel

cutting of circles. It embodies many new features such as: light weight insulated construction, proper lubrication, rugged track, and nonreversing motor.

A medium size National shape cutting machine will demonstrate shape cutting. Reduces shape cutting costs to a minimum.

"Flame Hardening" properly executed—eliminating the human element—resulting in identical accurate results.

"Torchweld" non-flash welding and cutting torches and regulators; each properly designed to do a certain type of welding or cutting, or supply a known volume of gas.

NATIONAL INDUSTRIAL PUBLISHING CO.
Pittsburgh

Booth B-118

In attendance: I. S. Wishoski, editor; J. McDevitt, representative.

Exhibiting: "Industrial Heating" — a monthly publication that specializes on furnaces, ovens, kilns and all industrial heating processes used in the manufacture, finishing, processing and heat treatment of metals and other products.

PARKER-KALON CORP.
New York

Booth I-211

In attendance: S. S. Kahn, assistant sales manager Roland Roe, sales engineer.

THE PARTLOW CORP.
New Hartford, N. Y.

Booth, Industrial Gas Exhibit

In attendance: H. W. Partlow, president; H W Partlow, Jr., vice president; A. M. Stock, vice president; B. L. Finn, Chicago representative; Oliver Stirling, Jr., Detroit representative; A. W Orton, factory superintendent.

Exhibiting (in operation): A display board showing line of temperature controls.

No. 40 throttling gas control. Model M indicating electric control, Model AR recording controller, and Saf-T-Flame gas pilot.

PRODUCTS FINISHING and MODERN MACHINE SHOP
Cincinnati, O.

Booth E-119

In attendance: Don G. Gardner, publisher; H. Campbell, editor (MODERN MACHINE SHOP); F. W. Vogel, managing editor (PRODUCTS FINISHING); J. M. Krings, advertising manager; G. M. Fillmore, Eastern manager; J. Vander Voort, Eastern representative; G. H. Meyers, Western manager; G. E. Hay, Central Western manager; G. J. Schwarber, service manager, and N. S. Rogers, art director.

Exhibiting: Displays featuring the two publica-

Walker's

CLEAR HARDWARE LACQUER No. 702

Recommended for outdoor durability, having extreme non-greening qualities, as well as perspiration resistance.

H. V. WALKER CO.
Elizabeth, New Jersey

FINISHES TO FIT THE PRODUCT

New England Warehouse, BROWN & DEAN, Providence, R. I.

tions. MODERN MACHINE SHOP and PRODUCTS FINISHING.

THE PYROMETER INSTRUMENT CO.
New York

Booth J-331

In attendance: A. Bollerman, secretary; L. Bollerman, assistant.

Exhibiting (in operation): "PYRO" optical pyrometers; bi-optical pyrometers; micro-optical pyrometers; remote-optical pyrometers; radiation pyrometers; immersion pyrometers; surface pyrometers; and radiation tubes.

RADIUM CHEMICAL CO., INC.
New York

Booth J-318

In attendance: R. G. Fordyce, Chicago representative; J. M. Morrison.

Exhibiting: The exhibit will consist principally of films showing defects in various castings, fittings and valves.

RESISTANCE WELDER MANUFACTURERS ASSOCIATION
Philadelphia

Booth A-137

In attendance: W. A. Anderson, president, Resistance Welder Manufacturers Association; E. C. Smith, vice president, Resistance Welder Manufacturers Association; G. A. Fernley, secretary and treasurer, Resistance Welder Manufacturers Association; Harry Rhinehart, assistant secretary and treasurer, Resistance Welder Manufacturers Association; M. S. Clark, chairman, publicity committee, Resistance Welder Manufacturers Association; J. D. Gordon, chairman, policy committee, Resistance Welder Manufacturers Association; E. J. Henke, American Electric Fusion Corp.; Julius Brueckner, National Electric Welding Machines Co.; F. E. Taylor, Swift Electric Welder Co.; I. C. Brown, Thomson-Gibb Electric Welding Co.; E. J. Del Vecchio, Taylor-Winfield Corp.; E. W. Forkner, Federal Machine & Welder Co.; Charles Eisler, Eisler Engineering Co.; P. W. Hall, Taylor-Hall Welding Corp.; Stanley M. Levyn, Acme Electric Welding Co.; Fred Johnson, Progressive Welder Co.; G. N. Sieger, S-M-S Corp.; J. A. Weiger, P. R. Mallory & Co.; E. W. Bremer, Electroloy Co., Inc.; Walt Simmons, Welding Sales & Engineering Co.; A. D. Jardine, Welding Machines Mfg. Co.; H. Molling, Expert Welder Co.; H. G. Warneke, Mult-Hydromatic Welding & Mfg. Co.

Exhibiting: Photograph boards showing representative resistance welding machines as designed and built by the various member companies. Also on display will be a number of sample boards illustrating representative and typical resistance welding applications.

RUSTLESS IRON AND STEEL CORP.
Baltimore

Booth G-210

In attendance: C. E. Tuttle, president; T. F. McLaughlin, vice president; W. B. Pierce, sales manager; S. P. Watkins, sales development division manager; R. W. Dietrich, sales engineer; R. L. Springer, Chicago district manager; M. K. Kahler, Chicago district.

Exhibiting (in operation): Rustless stainless steel bars, wire and products fabricated from them. A feature will be a presentation of original data and methods for the machining of stainless steel developed in a two year research program, and also an actual demonstration of tools, parts and equipment.

JOSEPH T. RYERSON & SON, INC.
Chicago

Booth N-313

In attendance: Greswold Van Dyke, George Roeder, W. O. Springer, John M. Acee, C. S. Hegel, P. B. Van Horne.

Exhibiting: Ryerson booth will feature a new alloy steel development.

E. H. SARGENT & CO.
Chicago

Booth L-318

In attendance: George W. Slomin, technical consultant; Dr. Lynn D. Wilson, technical engineer; Paul Sherrick, secretary and technical director; William Menzel, sales engineer; Edward Lohmann, sales engineer.

Exhibiting (in operation): Improved Model X Heyrovsky Polarograph. The advantages are: (1) It has extreme sensitivity; permitting qualitative detection and identification to one hundred millionth of a gram. (2) Quantitative accuracy in solutions as dilute as 10^{-6} normal. (3) Simultaneous qualitative and quantitative analysis of as many as six components of one solution. (4) Faster, more accurate determinations by eliminating many chemical operations and variables inherent in personal technique. (5) Every analysis photographically recorded, providing indisputable permanent records which are the most convenient authentic evidence of product analysis. (6) Samples as small as 0.1 ml. are adequate for routine analysis. (7) Repeated analyses can be made with one sample without altering composition of sample. (8) Many new analyses can now be performed that were previously impossible with other known methods.

Slomin electrolytic analyzer which has been newly designed gives faster and more accurate quantitative results for ferrous and nonferrous alloys, metals in biological materials, metals in foods, and electroplating solutions and electro-deposits.

The new Sargent high speed electrolytic analyzer designed to facilitate routines in laboratories required to produce large number of electrolytic analyses. Reduces time formerly required by 60%.

THE SENTRY CO.
Foxboro, Mass.

Booth J-319

In attendance: A. A. Harvey, sales manager; P. B. Crocker, treasurer; C. W. Rudolph, Chicago district manager; B. M. Brownell, St. Louis district manager; G. B. Duff, Eastern Penn., New Jersey, and New York district manager; A. F. Tenney, Dayton district representative; D. L. Thompson, Knoxville, district representative; Northern Ohio representatives from The Cleveland Duplex Machinery Co.; Western New York representatives from The R. C. Neal Co.

Exhibiting (in operation): Electric high speed steel hardening furnace, which by eliminating water cooling and simplifying the atmospheric control system offers economy and efficiency giving uniform, controlled hardening temperatures and heats to 2,350 degrees Fahr. in one hour.

Positive atmospheric control for molybdenum, tungsten and cobalt high speed steels as well as high carbon high chromium steels is maintained by the Sentry diamond block method, assuring maximum hardness, free from scale, decarburization, or reduction in size. Even the sharpest cutting edges and corners are retained during hardening. Many sizes of Sentry diamond blocks will be on display.

Continuous demonstration hardening during the show, and visitors are invited to bring sample tools for demonstration.

Also showing a Sentry high temperature (2,550 degrees Fahr.) tube furnace offering greater speed and precision for combustion analysis of stainless and other steels. The furnace and terminals are rugged in construction giving an average of more than five years' service, highly efficient and economical to operate.

SPENCER TURBINE CO.
Hartford, Conn.

Booth H-213

In attendance: A. W. Peard, Chicago manager; C. E. Kaufman, Chicago representative; F. A. Wright, special representative; R. A. Brackett, sales manager.

Exhibiting (in operation): Turbo-Compressors and industrial vacuum cleaners. The turbo-compressors shown are of the multi-stage construction both 1,750 and 3,500 r.p.m. These blowers are the recognized standard for gas and oil-fired, heat treating furnaces, selected for their quiet operation and dependable service.

Vacuum cleaning has become standard equipment removing the dirt and litter from floors, walls and overhead structures in many industrial plants. Complete sets of tools available for all kinds of cleaning work.

STANDARD STEEL SPRING CO.
Corapolis, Pa.

Booth L-314

In attendance: R. C. Enos, president; C. J. Quee-

★ MILLER ANODE GLOVES ★

Wear Longer .. Here's Why

★ All of rubber's original strength and flexibility are retained in Miller Gloves. They are made by the Anode process by which rubber is deposited direct from the latex.

You'll find Anode Gloves have greater tensile strength to resist snags and tears; possess long-aging qualities; are more uniform in thickness. Workmen prefer them for their comfort and high flexibility.

Miller Acid and Industrial Gloves are available with wrist-length rolled cuffs or 5" and 9" gauntlets in a complete range of thicknesses. Place a trial order now. Compare their performance with that of ordinary rubber gloves. They will quickly prove their economy. Call your local jobber. If he cannot supply you, write

MILLER RUBBER COMPANY, INC. • AKRON, OHIO

"Engineers in Rubber"

Miller

nan, vice president and general manager; T. N. Berlage, director of Corronite sales; C. B. Black, plant superintendent; Richard Rimbach, technical advisor.

Exhibiting (in operation): The exhibit will be devoted to the new corrosion proof coating "Corronite," a pore-free metallic coating. Samples of the coating as applied to welded electro-metallic tubing, skelp, a sucker rod, and a steel barrel will be on display.

An operating exhibit will show the "Corronite" coating under test in aerated solutions in comparison with other metallic coatings.

SURFACE COMBUSTION CORP.
Toledo

Booth, Industrial Gas Exhibit

In attendance: Frank H. Adams, general manager; C. B. Phillips, vice president in charge of sales; H. M. Heyn, sales manager, heat treat division; W. M. Hepburn, vice president in charge of engineering; J. A. Comstock, consulting metallurgist; E. G. de Coriolis, research director; R. J. Cowan, metallurgist; W. F. Herdrich, combustion engineer; Edw. Stephenson, Jr., combustion engineer; J. M. Brown, combustion engineer; W. O. Owen, combustion engineer; H. J. Gregg, combustion engineer.

Exhibiting (in operation): Manufacturers are invited to bring their molybdenum alloy and other steels (both high speed and carbon) for heat treating in the new Char-Mo controlled atmosphere furnace at the Surface Combustion booth in the Industrial Gas Exhibit.

The Char-Mo furnace was first exhibited at last year's show. It utilizes a specially developed controlled atmosphere for successfully and easily heat treating molybdenum high speed steel as well as other high speed and carbon tool steels, without decarburization and without the use of borax or other protective coatings.

C. J. TAGLIABUE MFG. CO.
Brooklyn, N. Y.

Booth K-335

In attendance: A. F. Rucks, general manager; C. O. Fairchild, director of research; E. D. Wacker, general sales manager; L. Van Blerkom, division sales manager; C. C. Hurst, R. H. Hix, W. W. White, H. W. Kerr and R. C. Staub, sales engineers.

Exhibiting (in operation): Among the many interesting instrument developments on display at the Tag Booth will be found: Potentiometer Pyrometers; Model V Vibration-proof Indicating Controller; Self-Balancing Indicating Controller; Self-Balancing Indicator with "In Balance" Signal; Recorder-Controller for Throttling Fuel Heat; Recorder-Controller for Throttling Electric Heat; Two-Point Indicating Controller; Multiple Point (up to 6) Indicating Controller; and Cabinet Type Indicator.

In addition to these Celectray Pyrometers and Resistance Thermometers, Tag Air-Operated Indicating and Recording Controllers, Tag Industrial Thermometers will be on display.

THE HENRY G. THOMPSON & SONS CO.
New Haven, Conn.

Booth B-131

In attendance: Henry Hock, district representative; and Robert Holton, assistant district representative.

Exhibiting (in operation): Display of new Flexible and Shatter-Proof High Speed Steel hack saw blades. Power hack saw machine demonstrating the speed and accurate cutting of the Milford Flexible Rezistor power blades.

TIDE WATER ASSOCIATED OIL CO.
New York

Booth B-129

In attendance: H. G. Mullen, industrial sales manager; F. W. Hallam, cutting oil engineer; F. C. Lempert, manager Pittsburgh district; A. E. Mould and F. C. Lempert, salesmen; and Walter Sauer, assistant advertising manager.

Exhibiting (in operation): A miniature stage on which five animated puppets, aided by recorded sound and slide film, enact an executive sales meeting at the offices of a metal working company. Through this unique medium the story of Tycol Cutting Oils will be told.

THE TIMKEN ROLLER BEARING CO.
Cleveland, O.

Booth D-117

In attendance: S. D. Williams, director of sales, Steel and Tube Division; D. T. Marvel, manager of tube sales, Steel and Tube Division; R. Atkinson, district manager, Detroit, Steel and Tube Division; D. S. Klippert, metallurgical sales engineer, Chicago; J. T. Irwin, metallurgical sales engineer, Chicago; R. P. Proffitt, district manager, Chicago; W. G. Hildorf, chief metallurgical engineer; H. N. Steinberger, metallurgist; S. R. Kallenbaugh, metallurgist; E. Koyle, metallurgist; T. R. Bissell, district manager, Cleveland, Steel and Tube Division; G. M. Lange, sales engineer, Milwaukee; and Fred Bonte, development engineer, Steel and Tube Division.

Exhibiting (in operation): Timken stainless steels, Timken aircraft quality steels, Timken tool and die steels, (with particular emphasis on Graphite Steel) and oxidation and corrosion resisting steels; Timken seamless tubing and Timken steel bars will be displayed, along with samples of fabrications of each. The exhibit will have ample table space, display panels, a variety of novel tube and bar mountings, a picture screen upon which will be thrown 27 different pictures at intervals of 20 seconds, and a voice articulated with the pictures to explain them. There will be an inner court arrangement where visitors will find

comfortable seats, a drinking fountain, and a table full of Timken steel literature. In the privacy of this inner court visitors can relax and see how Timken quality steels are made.

TINNERMAN STOVE & RANGE CO., Speed Nut Div.
Canton, Ohio.

Booth F-207

In attendance: A. H. Tinnerman, president; Geo. A. Tinnerman, general manager; G. Hansman, sales engineer; C. Judd, sales engineer; Wm. Buttriss, sales promotion; Lee A. Ticknor, Chicago sales; L. T. Reindl, Northwest sales; and T. O. Dahlstrand, sales.

Exhibiting: Comprehensive display of assemblies where the use of Speed Nuts and Speed Clips visually demonstrates possibilities for increase in efficiency and decrease in cost over conventional fastening means.

Automotive Assemblies — includes, rear fenders, fender grilles, headlamps, radiator shell, light switches, name plates and medallions.

Stove and Range Assemblies—oven door hinge, door handles, trim strips, control handles, assembly jig for panels.

Radio Assemblies—Plastic control knobs, name plates, condensers, chassis, wires, fixed torque for dial controls and plastic cabinets.

Refrigerator Assemblies—Door breaker strips, food compartment liners, name plates, evaporator supports, vegetable bins, temperature control knobs, hinges, hardware, detachable top panel.

Demonstration of How Speed Nut Flexibility of design combines four or five parts into one completely automatic production piece through use of our special four slide machines.

THE TITANIUM ALLOY MFG. CO.
Niagara Falls, N. Y.

Booth K-310

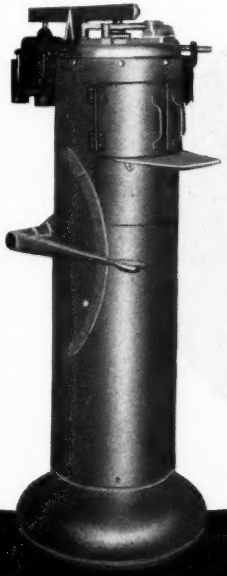
In attendance: Winthrop Sargent, Jr., vice president in charge of sales; E. T. Goodridge, assistant to the president; J. Murray Johnston, sales; G. F. Comstock, metallurgist; W. G. Wellings, chief development engineer; and S. T. Harleman, development engineer.

Exhibiting: Ferrous and nonferrous alloys of titanium and zirconium and examples of the uses and benefits of these materials as shown by the finished product.

UDDEHOLM CO. of AMERICA, Inc.
New York

Booth B-134

In attendance: G. Lofberg, president, Uddeholm Co. of America, Inc.; E. V. Enevik, vice president, Uddeholm Co. of America, Inc.; Hugo J.



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45 RIVER AVENUE • PROVIDENCE, R. I.

Kurtz, president, The Peninsular Steel Co.; Harry H. Kurtz, vice president, The Peninsular Steel Co.; Walter O. Kurtz, treasurer, The Peninsular Steel Co.; N. B. McKeagan, The Peninsular Steel Co.; L. E. Dallas, The Peninsular Steel Co.; Frank G. Davis, The Peninsular Steel Co.; G. E. Reminger, The Peninsular Steel Co.; William Trader, The Peninsular Steel Co.; Eugene Good, The Peninsular Steel Co.; Ray Wagner, The Peninsular Steel Co.; Leo Aldrich, The Peninsular Steel Co.; and Paul Hogland, Rockford Industrial Supply Co.

Exhibiting: Back wall display, lighted, featuring various types of steel manufactured by Uddeholm Co. and various sizes of tool steel carried by our distributors. Table display, lighted, featuring razor blades made from "AEB" Stainless Steel.

UNA WELDING, INC.
Cleveland, O.

Booth B-111

In attendance: W. B. Baker, general manager; P. J. Cella, sales engineer; R. P. Tarbell, sales engineer; R. B. Fehr, engineer; J. Skuhrovec, electrical engineer; and K. Schreeck, design engineer.

Exhibiting (in operation): Una Full Automatic Electric Welding Heads for light coated and shielded arc welding. Una Goodspeed Semi-Automatic Air Head for welding with light coated wire.

Complete line of forty different mild and alloy steel manual welding electrodes. Sample welds showing manual and automatic applications.

VANADIUM-ALLOYS STEEL CO.
Pittsburgh

Booth A-125

In attendance: R. C. McKenna, president; Floyd Rose, vice-president; James P. Gill, chief metallurgist; L. D. Bowman, works manager; F. P. Underwood, secretary; Lawrence Wood, assistant to vice president; and W. R. Mau, Chicago; Arthur Brookfield, Detroit; C. M. Stevenson, St. Louis; F. L. Stevenson, Cleveland; F. W. Potts, Cincinnati; G. W. Remensnyder, Buffalo; and R. R. Artz, Pittsburgh, district manager.

Exhibiting: Samples showing various types of tool steels manufactured, illustrating sections and finishes. Also display of tool steel fractures in annealed and heat treated condition.

VICTOR SAW WORKS, INC.
Middletown, N. Y.

Booth M-328

In attendance: Raymond B. Jones and A. V. Wilson, district representatives.

Exhibiting (in operation): Demonstrating hack saw blades in actual operation.

WHEELCO INSTRUMENTS CO.
Chicago

Booth J-332

In attendance: R. A. Schoenfield, sales manager; Fred Ohlrich, advertising manager; T. A. Cohen, chief engineer; H. J. Ostermann, assistant chemical engineer; Clarke H. Joy, sales and service engineer, Cleveland; C. W. Lugar, sales and service, Indianapolis; M. C. Schwer, sales and service, Detroit; and E. E. Whitaker, sales and service, Pittsburgh.

Exhibiting (in operation): Our new Potentiometer Controller which has only recently been announced. This combines the unexcelled sensitivity of the Wheelco "Radio Principle" control with the time proved accuracy of the potentiometric method of temperature measurement.

The new Thermometer Recording Controller will also be exhibited and is the first graphic instrument to be added to our line.

The Rheotrol, which is also a recent addition to our line, is designed to replace and far exceed the performance of the heretofore standard rheostat in its control action.

WHEELOCK, LOVEJOY & CO., INC.
Cambridge, Mass.

Booth L-316

In attendance: A. O. Fulton, president; F. H. Lovejoy, vice president; E. C. Bartlett, Cleveland manager; C. R. Jenks, Detroit manager; T. W. Knight, Buffalo manager; G. S. Longley, Jr., Newark manager; S. W. Parker, Chicago manager; A. R. Townsend, I. G. Stone, J. S. Dreher, Chicago sales.

Exhibiting: A variety of machine parts, dies and tools manufactured from Hy-Ten and S.A.E. alloy steels.

WILSON MECHANICAL INSTRUMENT CO., INC.
New York

Booth H-207

In attendance: V. E. Lysaght, sales manager; D. F. Sklar, development engineer; Paul Fee, Chicago representative; C. H. Thompson, Dayton representative; J. P. Roberts, Cleveland representative; Chas. W. Smith, Detroit representative; The Stanley P. Rockwell Co., Inc., New England representatives; Canadian Fairbanks-Morse Co., Ltd., Canadian representatives.

Exhibiting (in operation): "Rockwell" hardness tester. "Rockwell" superficial hardness tester. "Rockwell" motorized hardness tester. Special "Rockwell" testers for internal testing. Work support accessories for "Rockwell" hardness tester.

THE WIRE ASSOCIATION
Stamford, Conn.

Booth D-120

In attendance: E. M. Dixon, advertising manager, "Wire and Wire Products."

Exhibiting: Copies of "Wire and Wire Products" and directory for advertising managers.

ZIV STEEL & WIRE CO.
Chicago

Booth J-309

ZIV STEEL

In attendance: G. F. Ziv, president; H. E. Ziv, treasurer; F. A. Lawler, executive vice president; N. J. Hyslip, vice president; L. Elsman; R. Foley; A. Berg; C. A. Hintz, Milwaukee branch manager; C. A. Mulligan, St. Louis branch manager.

DARWIN & MILNER

In attendance: Victor F. J. Tlach, president; John C. Koch, secretary; H. L. Harrison, sales engineer; H. Gonser, welding engineer.

Exhibiting: Tools and dies.

Tank Painting. A folder describing methods for obtaining maximum results in painting interior and exterior surfaces on all types of tanks and supporting structures is now being issued by American Asphalt Paint Company, 43 E. Ohio St., Chicago, Illinois.

Realizing the many difficulties usually encountered in painting tanks, the paint technicians of this company have compiled all available information from experienced painters who have specialized in this particular field. With the aid of their valuable knowledge, many helpful pointers have been included.

General instructions and surface preparation in applying tank finishes are given. The methods for painting metal tanks on both the interior and exterior surfaces are clearly explained. Methods for quickly estimating surface areas and amount of paint required for various size and style of tanks are given.

A copy will be sent free upon request.

"Colors and Their Matching" is the title of an eight-page issue of "The Enameler's Reference" by Roger K. Taylor which is now being issued by The Porcelain Enamel & Manufacturing Co., Eastern and Pemco Aves., Baltimore, Md. Included in the catalog is a brief description of colors and procedure for their matching.

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195 LAFAYETTE STREET NEW YORK, N. Y.

FINISHING NATIONAL CASH REGISTERS

Present-day architectural designs require finishes for products that harmonize with surroundings.

By J. FREY

Foreman, Enameling Department, The National Cash Register Co., Dayton, Ohio

THE elaborate modernization programs of many offices and stores during the past few years have fostered a demand for accessory equipment of harmonizing design. As a direct result, items such as lighting fixtures, desks, display cases, cabinets, computating and recording machines, and so on have appeared in new and beautiful modern streamline designs dressed up in finishes characterized by color and sparkle and fabricated from many new and unusual materials.

The "Class 6000" National Cash Registers are finished in black wrinkle enamel and trimmed in gleaming chrome plate.

Prominent among the items of equipment to be found in every modern store is the cash register and this, too, has been restyled to conform with the latest ideas in modernity of contour and finish. The methods employed in the processing and finishing of cash register units in one of the largest plants of its kind in the world—The National Cash Register Co., Dayton, Ohio—forms the basis of an interesting story. These methods are described in the following article to show how quality workmanship and increased production have been maintained through the proper coordination and semi-automatic and full automatic equipment and also how unusual harmonizing effects have been obtained through the application of wood grain, steel gray opalescent, and black wrinkle enamel finishes on register cabinets and parts.

In the grinding department located adjacent to the foundry, snag grinders of both stand and

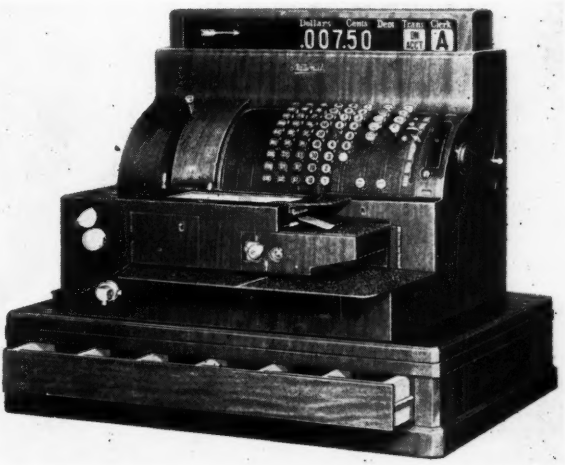
The gray opalescent finish on this "Class 100" National Cash Register is a neutral shade which harmonizes with a variety of color schemes.

portable types are used on a variety of small castings that are scheduled to receive coatings of enamels. Parting grooves formed by the mold during casting, burrs, and sharp edges are removed as a preliminary finishing operation to polishing.

After grinding, the parts are carried to the polishing department by means of an overhead conveyor where grinding wheel marks and surface imperfections such as pits and scratches are removed. Two steps are required for the polishing operation, and each is performed on separate dry wheels.

The first of the polishing operations is performed on a dry compressed leather wheel which is coated with No. 70 abrasive grain. The second polishing operation is performed on a cloth wheel which has been coated with No. 90 abrasive grain.

The polished parts are placed on trucks which are used to carry them to the assembly room. In the assembly room the parts are assembled and the various panels of the cabinets are fitted together and hinged doors are properly adjusted. When the cabinet is completely assembled, an inspector checks it for the quality of the preparation finish to which the parts have been subjected thus far. Those cabinets which pass the rigid inspection are placed on an overhead conveyor which carries them to a Bonderizing department. All parts that are lacquered or enameled are treated with the Bonderizing solution to provide an adhesive surface for the finish. Inasmuch as the register units are marketed all over the globe in places where temperature changes, humid and rare atmospheres, and



Many metal cash register cabinets are attractively finished with wood graining as the unit shown in this illustration.

Fig. 1—The first ground coat is applied to the metal register cabinets by the workmen shown in this illustration.

abuse during transit to the various marketing points result, it is important that maximum adhesion be obtained between the base metal and the finish coating. The Bonderizing solution provides the means for obtaining the maximum adhesion.

The parts are thoroughly rinsed in clear water to remove any traces of the Bonderizing solution. Any water that remains on the parts is evaporated when they are passed through a drying oven provided for this purpose. The conveyor chain of the drying oven is located in such a manner as to permit the parts to be carried directly into the enameling department following drying.

A view of the enameling department into which the parts are conveyed after drying is shown in Fig. 1. The register cabinets can be seen as they pass suspended from the overhead conveyor in front of a line of spray operators. The spray guns in this illustration are fed from a central supply mixing room, where the various colored enamels are prepared for application. Adequate lighting is provided by means of the explosion-proof lights located in the recesses directly above the operators and work. Full, through draft air ventilation is used to draw out and away all excess fumes and spray.

The enamel which is applied by the spray gun operators shown in Fig. 1 is referred to as the ground coat. This coating is of a heavy consistency and provides a solid base for the finish coatings that follow. The first ground coat is baked for one and one-half hours at a temperature of 225 degrees Fahrenheit.

As soon as the cabinets pass through the ground coat baking oven and cool sufficiently to be handled, they are checked for minor defects

which are then immediately glazed with a putty compound. Also, any small holes that remain after polishing are filled so that only a smooth and flawless surface remains. The cabinets are then ready for a second ground coat which is applied in the same manner as the first and baked for the same length of time and at the same temperature.

As soon as the parts are sufficiently cool to handle, they are removed from the conveyor and dry sanded. No. 0 abrasive paper is used.

After the sanding operation, the cabinets are separated into two groups. One group is placed on an overhead conveyor which carries them into the graining department and the other group is transported into the solid color and gray metallic finishing department. A general view of the graining department is shown in Figure 2.

At the National plant, the wood grain figure that is used for transference to the metal cabinet is etched into a sheet of copper. In order to obtain the transfer, the copper plate is inked with a special transfer compound. Rolls composed of both gelatin and rubber are used to pick up the impression in the copper sheet. The roll on which the grain has been impressed is then brought in contact with the cabinet being finished.

The parts on which the graining compound has been applied are baked for one and one-half hours at 225 degs. F. After the baking operation, the cabinets are ready for a coating of clear lacquer which is applied to preserve the beautiful effect obtained through the application of the graining compound. The clear lacquer which is applied is dried for 45 minutes in an oven which is maintained at a temperature of 120 degs. F. A

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second coating of clear lacquer is also applied and baked for the same length of time and at the same temperature as the first. The second coating of clear lacquer is rubbed down with oil and pumice. Following the rubbing down, the cabinets are ready for the final inspection and the complete assembling.

The cabinets that are removed from the conveyor chain prior to the graining operation are placed in groups of six on trucks which are taken to a special totally-enclosed spray room. In this spray room, the metallic gray and solid colors are sprayed on and then baked at 300 degs. F. for one and one-half hours. The metallic gray enamel cabinets are given two coats of clear synthetic enamel and are baked at 300 degs. F. for one and one-half hours. The final appearance of this type of finish is a deep gloss. From the final baking operation, the cabinets are conveyed to the final inspection department, where they are assembled in the same manner as the wood grained cabinets and parts.

Fig. 2—Wood grain impressions are removed from etched copper plates by means of gelatin and rubber rollers as shown in this illustration.

Standard Chemical and Technical Dictionary. A condensed technical word book for students, writers, technicians, engineers, scientists, and all others who need assistance in keeping up with the many new chemical, physical, mathematical, engineering, and technical words of expression has been prepared by H. Bennett.

More than 25,000 definitions are included in this book which is being published by Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y., and is being sold at the price of $10.00

per copy. This Standard Chemical and Technical Dictionary is a compilation completely covering industrial products, chemicals and trade names, abbreviations and contractions, as well as the symbols used in mathematics, chemistry, thermodynamics, pharmacy, and so on.

A special section is devoted to the explanation and the proper naming of organic compounds. The rules for the nomenclature of the organic compounds are stated clearly. The prefix names of the organic radicals supplements this.

Every device has been used to make the dictionary one that is practical and easy to use. Complete cross references are used. Matter of a similar nature is grouped together. A standard system of alphabetizing has been used which makes it possible to find even the most complex organic compound. The symbols have been arranged so that any one can be found at a moment's notice.

Accelerated Weathering of Paints. An eight-page report of comparisons by the accelerated and outdoor exposure tests reprinted from the bulletin of the Ontario Research Foundation is now being issued by Atlas Electric Devices Co., 365 W. Superior St., Chicago, Ill. This report shows a comparison between outdoor exposures and those made in the Weather-Ometer in the Ontario, Canada, Research Laboratory.

This report is fully illustrated with photographs and will be of interest to those engaged in the application of finishes for outdoor use. A copy of the report will be sent to anyone writing to Atlas Electric Devices Co., 365 W. Superior St., Chicago, Ill.

Davis Solenoids, Coils and Transformers. A catalog featuring custom-built solenoids, coils and transformers has been issued by the Dean W. Davis & Company, Inc., 545 W. Fulton St., Chicago, Illinois.

Graphs giving technical information plus illustrations of some of the many applications of solenoids to modern machines are included.

A copy of this catalog will be sent free upon request.

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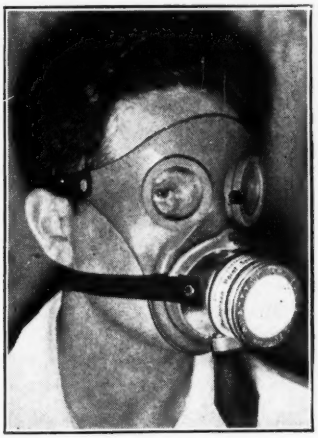

New! PULMOSAN GR-251 GOGGLE-RESPIRATOR

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Combines a newly designed all-rubber face mask, with clear goggle lenses and a chemical respirator. Protects eyes, nose, throat and lungs. Respirator has a chemical cartridge to purify inhaled air, plus outer dust filter to prevent clogging of cartridge. Ensures wearing of respirator and goggles where hazards necessitate both. Face piece fits any Pulmosan Respirator. Available in various types of lenses. Very light and comfortable to wear. Write for prices and further details on this valuable safeguard.

ALSO . . . Carboy Truck and Tilter, Respirators, Goggles, Aprons, Gloves, Hoods, Skin Protective Creams, Pails and Dippers. Write for leaflet "Safe Handling of Acids and Chemicals."

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Dept. PF, 176 Johnson St., Brooklyn, N. Y.

BARREL FINISHING OF METAL PRODUCTS

A Discussion of Barrel Cleaning by Agitation

By H. LEROY BEAVER

IN this discussion, we endeavor to draw a comparison between one of the oldest cleaning problems that has beset the human race almost from the very beginning of mankind, namely, a restoration to a condition of cleanliness of worn or used wearing apparel and fabrics and the methods of accomplishing this operation as distinguished from some of our present-day procedure in the cleaning of metal products prior to final finishing whether it be plating, lacquering or some other form of final marketable finish.

In a discussion of this subject back in 1938, we quote Mr. J. Fred Oesterling, Research Fellow of The Pennsylvania Laundryowners at Pennsylvania State College, as follows:

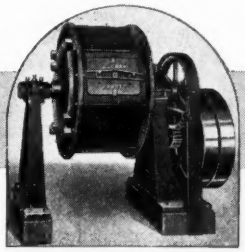
> "Indeed it might be facetiously alleged that the origin of this task (the cleaning of clothes) goes back to that memorable day of catastrophe in the Garden of Eden when our original ancestors celebrated the first of the "eat more fruit" days, thus starting many unexpected and disagreeable sequences which have harrassed and worried their descendants ever since. Among these were clothes and the necessity of preserving them and keeping them fit for wear by periodical cleaning was soon apparent."

It has always seemed to your writer that in much of the research work that has been done in the past in connection with the cleaning of metal products, we have followed a comparatively narrow line, that is, we have confined our work too closely and have not taken as much advantage as we might have of research in other fields of endeavor that ran, at least to some extent, parallel to our own problems. Most of our Doctor friends in electrochemistry seem to have certain well defined rules for the approach to a problem in their conduct of research work, and some of them have been kind enough to say that our approach to the same problems is perhaps the most unorthodox imaginable and the reason that we achieve results is based on the same theory that if we were to turn a blind hog loose in the woods it would be altogether con-

ceivable that he would find a few acorns. So in the search for another acorn, we turn to the laundry industry to see whether in procedures employed there, we can learn something that would be helpful in the cleaning phase of the barrel finishing of metal products.

The laundry industry in this country, from all we can gather, is just about parallel with that of the barrel finishing phase of our industry in that it is just about one hundred years old, and, like our industry, in the early days many of the operations were carried on by what we might term "rule of thumb" methods, and like us in the early days each plating shop had its own secret formulas and procedures which in many cases we now know were quite common to all.

If we should say that in the modern laundry of today the particular instrumentality that is termed a wash wheel is practically on all fours with our present tumbling or burnishing barrels, that would be only the simple fact, for in the cleaning of clothes it is current practice to operate them in a revolving barrel or drum with suitable cleaning materials. These barrels could be more simply described by saying that they are a revolving cylinder within an outside cylinder or case which is stationary, and the only way in which they differ from our present-day metal finishing barrels in operation is that they turn eight revolutions in one direction and then automatically reverse and turn a like number of revolutions in the opposite direction. Any laundry operator will tell you that the mechanical operation necessary for soil removal is essentially a mild tumbling process. Each load of clothes is given from three to five,



Barrel Finishing

earns profits 3 ways

1. Work hardens the surface of small metal parts, increasing wear resistance.
2. Closes the pores in the metal, increasing resistance to corrosion.
3. Produces brilliant finish on plated and unplated parts.

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THE ABBOTT BALL COMPANY
1060 New Britain Ave. Hartford, Conn.

ten-minute soap and alkali baths in four to five inches of soft water and is followed by rinsing in from four to seven changes of soft water. The temperature of both washing baths and rinsing baths rarely are allowed to go above 160 degs. F.

Many people assume that when we speak of a laundry soap that we refer to a product that is used in laundries just as it comes from the manufacturer and being identical in character with that used in home laundry practice. By far the greater part of the barrel operators in this country use just such a soap in the finishing of metal products. Now the truth is that the average laundry could not get clothes clean by using average market soaps in any length of time that might render the operation profitable and so to speed up the action as well as to obtain additional cleanliness, they resort to what we know as "builders," which are alkaline products which when added to the ordinary laundry soap render it far more effective. It is a comparison of just this phase of laundry procedure that we wish to draw our parallel to present-day practice in barrel finishing of metal products with respect to the addition of builders to commercial soaps to render them more effective in barrel operations. When we speak of a "builder," we refer to one or more alkalies which we can add to the customary soap to improve its effectiveness as a detergent. The most common of these are found in such products as sodium hydroxide, sodium metasilicate, trisodium phosphate, sodium bicarbonate or sodium carbonate. Each of these products may be added individually or in a combination with soap.

Alkaline builders when used with soap are in no sense intended to replace soap, but when so used, they perform a number of functions. In the laundry industry they have a term rarely if ever used in the metal industry but which we think might well be adopted to cover a general condition, and that is the word "SOIL." This term would be used to designate any foreign oil, grease, smudge, earth or other residual matter that was found necessary to remove to obtain a condition of cleanness. In soiled clothes as in dirty metal products, when either are placed in soft water they will be found to give a slightly acid reaction and so we might say that the first function of an alkaline builder when added to soap is to neutralize such acid. Secondly, such builders act as softeners for hard water conditions.

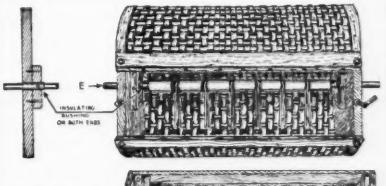
While for the most part barrel operations with which we come in contact are carried out with water at normal faucet temperatures, there are other cases where live steam is fed into the water line and barrels are charged with water little short of the boiling point. When such water is used with an ordinary commercial soap to which no builder has been added, the soap decomposes rapidly and in so doing forms free fatty acids and especially so when the soap concentration is too low. Right here, we might rise to ask what brilliant mind first conceived the idea of adding two ounces of soap chips to each barrel load of parts, irrespective of the size of barrel or the condition of the material to be finished. No such hard and fast rule can be applied, for there are cases where perhaps such a quantity might be sufficient but there are many more where this quantity would prove to be wholly inadequate from both lubrication and detergent aspects. The water temperature which we have found best in barrel operations on metal products is perhaps coincidentally identical with that used in general laundry practice, namely 160 to 170 degs. F. When

soaps are not used in sufficient concentration or where no alkaline builders are utilized and the soaps decompose to form fatty acids, this condition is almost invariably accompanied by a factor known in laundry parlance as "falling suds." When this occurs, the soil held in suspension is redeposited on the clothes and all white materials have a gray cast. In the finishing of metal products, a like effect causes the metal parts to come from the barrel with a dull, greasy looking appearance due to a similar condition. Generally speaking, we may say that the use of alkaline builders prevents the tendency of soap to hydrolize and adds greatly to its efficiency as a detergent.

Perhaps from the foregoing, the reader will sense that aside from the use of alkaline builders in the soap, the most essential comparison is that in the cleaning of clothes the operation is performed by agitation of the material in a detergent solution. If we should go into a modern laundry and see the operators stringing the clothes out on long lines or rods and then slowly immersing them into tanks containing alkaline solutions and almost immediately withdrawing them we might almost immediately conclude that reason had apparently departed and yet that is exactly what we do in the modern phase of metal cleaning prior to plating.

In the course of these papers we have received many samples submitted for opinion and suggestion on many phases of metal finishing. On all of these parts and especially on stampings, we submit them all to the same test, with particular attention to those parts that are designated as being cleaned and ready for plating. We take these parts and place them in a beaker, cover them with distilled water and then add trisodium phosphate in the proportion of four ounces to the gallon. This solution is then boiled for thirty minutes after which it is set aside for twenty-four hours. In all too many cases, we find on examination a thin film of inert residue on the bottom of the beaker with accompanying rings of soil material on the sides where the water level falls during the boiling process, and coupled with this a film of oil sometimes very slight and at other times fairly heavy on the surface of the water. All of this seemingly indicates either inadequate cleaning methods, improper cleaning agents or the lack of some essential thing in the cycle of cleaning.

While all of our previous discussion has been concerned with other factors than cleaning in the barrel finishing process, and while we still maintain that the principal function of soap in the barrel finishing cycle is to act as a lubricant, we must apparently revise our views in this respect for the very simple reason that



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we have apparently been unable to convince operators of barrels that it is just as essential to have parts properly cleaned before being placed in the barrel as it is to have them properly cleaned before placing them in the plating barrel or tank. We are very definitely and exactly in accord with that school of thought that maintains that before we can make much further progress in the permanent electrodeposition of one metal on another, that we must first learn more about the composition of the basis metal and how to prepare it to receive the plate and in which factor the principal matter for concern is cleanliness of the basis material. If methods of simple immersion in a cleaning tank either with or without electric current are proving to be inadequate, then we must turn to some method that will furnish more uniform and more satisfactory results, and we know of no better path to take than to develop methods for cleaning metal parts while under agitation in a barrel and not unlike the process used by the average modern laundry in the cleaning of clothes.

Barrel methods of cleaning are not new and there are many applications in this country where screw machine products more particularly are cleaned in this way, and the practice as we understand it is quite common in England. We have quite an extended description from one of our good friends in the English plating fraternity covering their operating cycle of barrel cleaning where only successive changes of water and sodium hydroxide are used. Depending on the material, it may require one or several operations before the work is considered to be clean, but the samples of plated parts as submitted by them following this cleaning cycle will compare favorably with the character of like parts in this country.

That the thought of cleaning by agitation in barrels is not orginal one is evidenced by the fact that several manufacturers of cleaning compounds have discussed this question with the writer of this series often at great lengths, and we cannot see that there should be any difficulty in developing both the barrel and the operating cycle. Certain it is that if we take even a commercial soap and add to it an alkaline builder and then supplement this with one of the modern, but effective wetting agents, we should be able to bring parts from barrel cleaning cycles where they are operated under agitation in a far cleaner condition than would be possible to obtain from any still tank form of cleaning. Certain it is that if the average laundry can devote three to five, ten minute cycles to a batch of clothes, or in other words thirty to fifty minutes, and still maintain this not only as a mechanically possible but commercially practicable process then we in the metal finishing field should be able to do equally as well in the application of a like method to the cleaning of metal parts. In regard to the rinsing in from four to seven changes of soft water, that is something we have never seen in any plating plant. It might be argued that such a cycle would be entirely too expensive due to the amount of cleaner that would be required, but this objection could be very easily overcome because by the use of by-pass valves the cleaning solution could be passed through a filter back into the stock tank and the subsequent rinsing waters passed down the waste drain.

It is not unlikely that a cleaning barrel for American use would conceivably be of the oblique tilting type, with a permanent outer shell inside of which a screen type shell would be operated and the cleaning solution sprayed into the barrel under pres-

sure. There would be no scarcity of effective cleaning materials because we now have them in wide variety skillfully compounded and many of them containing the most modern and effective wetting agents and detergents. The argument that such a barrel might badly mar or scratch parts presents no serious problem for the reason that such a barrel would be operated at a much lower speed than the conventional burnishing barrel, and the general operation would not be unlike the present operation of a perforated plating barrel in a tank of plating solution and if we do not seriously mar parts in the barrel plating cycle neither would we do so in a cleaning operation carried on under much the same conditions.

At different times in the course of this series, we have used the phrase when discussing a given phase of barrel finishing, "on a large majority of parts" and the question is now asked "What about the minority of parts, which, though it may be small is no less important?" We realize that barrel finishing has its limitations, and that some parts can be successfully finished while others cannot. We have repeatedly stated that barrel finishing procedures were not a panacea and most certainly not 100 per cent applicable. Like many other processes used in the finishing of metal products, they have an application along certain well defined lines, and we know of no process effecting any of the phases of metal finishing that could honestly be termed 100 per cent applicable to every finishing condition, and this is equally true of barrel finishing operations. From the extent of our research, we do say that there are more parts that can be finished than that cannot be finished, in barrels, and that we have by no means discovered or have even come close to a realization of the possibilities that lie in barrel finishing procedure. We know that little ingenuity has been shown by the American barrel manufacturers in the development of new barrels, and we are certain that the tendency, once barrel operations are more generally understood, will lead us to larger size barrels to obtain the full effect of the barrel operation and the abandonment of the small "play toy" type so prevalent today where the finishes obtained can only be described as superficial and for the most part inadequate and where the light loads of burnishing material cannot completely perform the function for which they were intended.

Serving Industry. A 34-page catalog devoted to the manufacturing and processing industries is now being issued by Sun Oil Company, 1608 Walnut St., Philadelphia, Pa. A portion of the catalog is devoted to the application of mineral solvents. The mineral solvents

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PLATING ALUMINUM COMMERCIALLY

The solution to many problems encountered in the job finishing shop will usually be found in a careful analysis of the new developments in methods and processes for the finishing field.

By Bartlett West

TO those who have had experience with the processing of aluminum, the problems of obtaining satisfactory finishes on this metal are not new. Interference with the normal flow of current due to a rapid formation of an insulating oxide coating on the surface of aluminum workpieces when subjected to a plating bath is a condition with which the electroplater is familiar. Up to very recently, most platers despaired of finding any way to alleviate this condition and many are the electroplaters who will not attempt to plate aluminum.

Illustration showing several articles that have been plated following the process which is described in this article.

We have recently been fortunate in becoming acquainted with one job shop where aluminum is being plated —and successfully. This is the shop of Philip Sievering, Inc., 203 Lafayette St., New York City. The reputation of this company for successfully handling this type of work has attracted a good deal of attention from the trade and has resulted in a steady increase in business. Regular jobs that come to this plant consist of die cast hardware, decorative wrought aluminum, and stamped aluminum moldings of all kinds. For aluminum plating, the Travers-Alume Process is used.

The department devoted to the finishing of aluminum workpieces occupies a portion of the regular plating department which is located on the fourth floor of the building occupied by Philip Sievering, Inc. Barrel finishing, lacquering, painting, polish-

ing, and a variety of other job finishing operations are employed in the various departments that are located on the three floors directly below the plating department.

Figure 1 shows a view of the plating department where the solution tanks and controlling equipment used for the plating of aluminum are located. A rubber-lined steel tank shown in the foreground contains an oxalic acid solution in which the pieces of work are suspended for a specified length of time, depending upon the thickness of the oxide or anodic coating desired. Six work bars that are insulated against the tank by means of white insulators located on the rim of the tank are also adjustable for accommodating various sizes and shapes of aluminum workpieces. The capacity of the oxalic acid tank is approximately 350 gallons.

A series of cooling coils are located around the inside surface of the oxalic acid tank so that the temperature of the solution can be maintained at 70 or 80 degs. F. regardless of room temperature.

The oxalic acid or anodic treatment of the aluminum workpieces is the first treatment to which the workpieces are subjected after they are removed from an electrocleaning solution and rinse. As shown in the illustration, the pieces are racked for the oxalic acid treatment in the same manner as workpieces are racked for an electroplating process. In contrast with normal plating practice, alternating current instead of direct current is used during the time that the workpieces are immersed in the

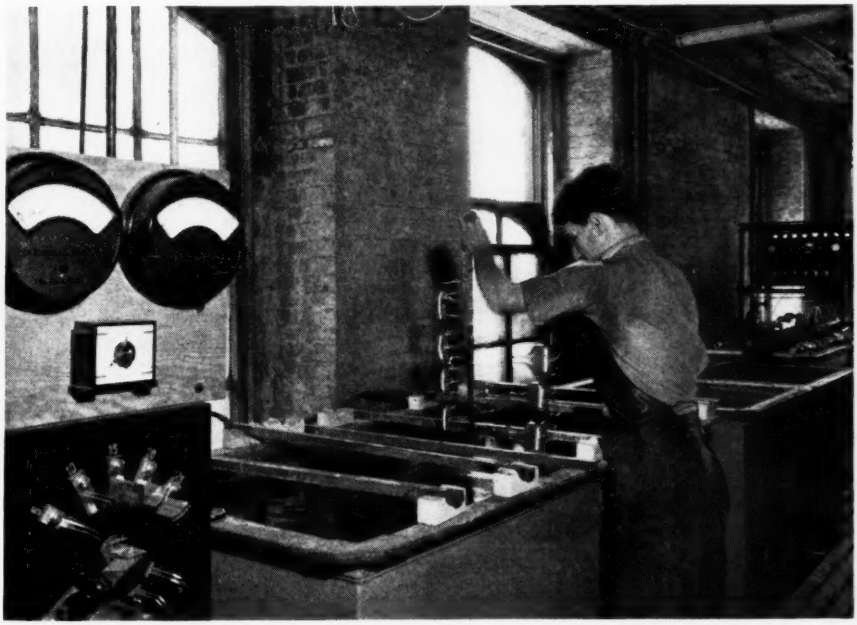

Fig. 1—A view of the aluminum plating department showing the convenient location of tanks and control panels.

oxalic acid bath for treatment.

An oxide or anodic film forms on the surface which, as stated before, is characterized by the inability to conduct a flow of current. As a result, the voltage which aids the current to pass through the solution must be increased in proportion to the thickness of the oxide coating that is formed.

A knife switch control, shown at the left in Fig. 1, provides the means for stepping up the voltage when the normal flow of current is retarded due to the oxide formation on the surface of the workpieces. The graduations of this controlling mechanism afford a voltage range of 5 to 50 volts, thus ten separate steps of five volts each are available. An automatic timing mechanism located on the control panel insures an accurate method of checking the length of time the workpieces remain in the solution.

Up to this point, the procedure would seem adverse to normal plating practice in two ways. One is in the use of alternating current and the other is the deposition or accelerated formation of an oxide coating. However, after the pieces leave the oxalic acid solution, they are placed in a "modifier" bath which contains a solution that has a tendency to penetrate the minute interstices of the oxide coating which enables subsequent plated coatings to adhere to the surface of the aluminum. The action of the modifier solution in penetrating the interstices or opening the pores of the oxide coating obtained during the previous treatment also permits a flow of current during subsequent plating operations. Fig. 2 shows an operator placing a rack of

Fig. 2—The nickel plating tank which is used during the plating operation following oxalic acid treatment is shown at the right in this illustration.

oxide coated workpieces into the "modifier" bath. The modifier solution is kept in a plain steel tank which is equipped with both heating and cooling coils so that the temperature of the solution can be maintained at 80 to 85 degs. F. at all times.

While metals other than nickel can be successfully deposited on the oxide treated surface, it has been found by experiment that a nickel coating is most satisfactory. After the nickel coating has been applied, the aluminum workpieces can be plated with practically every type of metal. A view of the nickel plating tank which is used exclusively for the nickel plating of aluminum articles at the Sievering plant is shown at the right of the illustration designated as Fig. 2. A standard Watts solution is used in this tank with the result that smooth and adherent deposits have been obtained. A Udylite rheostat located on the control panel at one end of this nickel plating tank aids in maintaining at all times an accurate check on the voltage and current passed into and through the solution during the plating operation.

Four rows of Harshaw nickel anodes replenish the nickel content of the solution. A specially built double-bar agitating unit on which the workpieces are hung during the nickel plating operations was constructed by the Belke Manufacturing Company.

The nickel plating operation is followed by copper, chrome, or any other metal plate as specified by the customer. Aluminum parts plated in the manner just described have increased wear resistance and a quality coating that remains beautiful indefinitely.

Electroplating Rectifier Bulletin. Bulletin ER-102, issued by the Hanson-Van-Winkle-Munning Co., Matawan, N. J., manufacturers of electroplating equipment and supplies, is the first complete detailed treatise on this new type of equipment for producing low-voltage, direct current for electrodeposition. It describes the principle of copper-oxide rectification, the construction of the complete rectifier, its operating characteristics, its applications and advantages. A few representative testimonials are given from users of rectifiers.

The bulletin is profusely illustrated by means of electrotypes made with H-VW-M copper-oxide plate-type rectifiers.

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Dust Engineering. A 12-page catalog designated as Volume Four which deals with dust, dust problems, and dust control equipment is now being issued by the American Air Filter Co., Inc., 131 Central Ave., Louisville, Ky. This catalog illustrates and describes the latest developments in air filtering equipment designed for industry.

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FOURTH ANNUAL PORCELAIN ENAMEL INSTITUTE FORUM

Significant Developments will feature Symposiums to be conducted.

DESIGNED to appeal to the interests of all practical enamelers, the most varied program in the series of yearly Porcelain Enamel Institute Forums is promised for the Fourth Annual Forum, to be held October 18th, 19th and 20th at Ohio State University, Columbus.

In addition to the general sessions, specialized groups in the enameling industry will find sessions devoted to discussions of their particular problems. For instance, one of the meetings that promises to produce exceptionally lively comment will be a session on architectural enameling to be held Thursday afternoon. The men interested in cast iron work, sheet iron, and hollow-ware will likewise meet separately.

With the introduction of three symposiums on as many outstanding subjects, the program this year will depart from the usual procedure calling for presentation of set papers. The Forum Committee feels that the symposium idea, with several contributors to the subject, will assure the expression of a variety of views and the fullest possible interchange of experience and opinion.

A large attendance is expected as the result of these program features. Each year the Forum has grown in its influence on the porcelain enamel industry. Many of the new developments in the industry during the last three years may be attirbuted to this yearly opportunity for shop men to get together for frank and instructive comment on their mutual problems. The program for the sessions at Columbus follows:

Wednesday, October 18th

10:00 A. M.—Registration, Social Administration Bldg.

Wednesday Afternoon, October 18th

2:00 P. M.—General Session, Room 100, Social Administration Bldg.
Presiding: R. M. King, Ohio State University

Address of Welcome.....Dean C. E. MacQuigg, Ohio State University

Response.....F. E. Hodek, Jr., General Porcelain Enameling & Mfg. Co.

Symposium on Fine Ground Enamels.....E. C. Aydelott
Benjamin Electric Mfg. Co.

Assisted by: E. W. Dietterle, American Stove Co.
C. T. Gordon, Porcelain Metals Corp.
T. Hartshorn, A. J. Lindemann & Hoverson Co.
J. B. Simon, Westinghouse Elec. & Mfg. Co.
Norman Stolte, Enamel Products Co.
G. E. Terry, Edison General Elec. Appliance Co.
Geo. N. Tuttle, Frigidaire Div., General Motors

Thursday Evening, October 19th

8:00 P. M.—Annual Meeting, Technical Research Section, Porcelain Enamel Institute, Deshler-Wallick Hotel
Presiding: R. R. Danielson, Metal & Thermit Corp.

Thursday Morning, October 19th

9:30 A. M.—Dry-Process Cast Iron Session, Room 125, Lord Hall
Presiding: F. B. Mahoney, Humphryes Mfg. Co.

Sunflowers and Powder Blisters.....R. R. Danielson, Metal & Thermit Corp.
Fineness of Enamels.....Speaker to be announced
Cast Iron for Enameling Purposes.....Speaker to be announced

Thursday Morning, October 19th

9:30 A. M.—Sheet Iron and Hollow-Ware Session, Room, 100, Social Administration Bldg.
Presiding: B. T. Sweely, Chicago Vitreous Enamel Products Co.

Use of Softened Water in Cleaning and Pickle Room Practice...E. H. Shands Geo. D. Roper Corp.
Drawing Compounds.....G. W. Dykstra, Kelvinator Corporation
Health Hazards and Their Control in Pickling Operations.....M. A. Snell Hartford Accident & Indemnity Co.

Thursday Afternoon, October 19th

2:00 P. M.—Dry-Process Cast Iron Session, Room 125, Lord Hall
Presiding: Homer F. Staley, Metal & Thermit Corp.

Symposium on Dry Process Enameling Problems.....

Thursday Afternoon, October 19th

2:00 P. M.—Architectural Session, Room 100, Social Administration Bldg.
Presiding: P. B. McBride, Porcelain Metals Corp.

What the Jobbing Shop Must Do to Handle Architectural Work, A. C. Weierich, Davidson Enamel Products, Inc.
The Architect Looks at Porcelain Enamel.....W. S. Arrasmith, Architect
Development of Specifications That Will Meet Building Code Requirements.....J. H. Wilson, American Rolling Mill Co.

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Thursday Afternoon, October 19th

2:00 P. M.—Hollow-Ware Session, Room 233, Lord Hall
Presiding: E. C. Dexheimer, National Enameling & Stamping Co.

Some Observations on a Settling Test for Determining the Fineness of Porcelain Enamels,
M. H. Whitehead, National Enameling & Stamping Co., and L. A. Lange, Chicago Vitreous Enamel Product Company

Effect of Variations of Enameling Between Draws.....John C. Crombie
Carnegie-Illinois Steel Corp.

Control of Enamel Application.....Speaker to be announced

Thursday Evening, October 19th

7:00 P. M.—Banquet and Entertainment, Deshler-Wallick Hotel

Friday Morning, October 20th

9:30 A. M.—General Session, Room 100, Social Administration Bldg.
Presiding: J. B. Simon, Westinghouse Elec. & Mfg. Co.

Use of Fuel Oil in the Enameling Field.....Richard Blynck
Standard Oil Co. of Ohio

Ball Milling Practice.....A. H. Burnham, Jr., Locke Insulator Corp., and Harry Sechrist, Vitreous Steel Products Co.

Presentation of new bulletin—"Ball Mill Wet Grinding,"
Roger L. Fellows, Chicago Vitreous Enamel Prod. Co.

A Proposed Tentative Standard Test for Impact Resistance,
W. N. Harrison, National Bureau of Standards, and Paul L. Smith, Porcelain Enamel Institute

Friday Afternoon, October 20th

2:30 P. M.—General Session, Room 100, Social Administration Bldg.
Presiding: J. J. Canfield, American Rolling Mill Co.

Inspection, Checking and Field Problems of Porcelain Enameled Products,
R. F. Bisbee, Westinghouse Electric and Manufacturing Co.

Welding for Enamel Parts.....Speaker to be announced

Forum Plans for 1940,
F. E. Hodek, Jr., General Porcelain Enameling & Mfg. Co.

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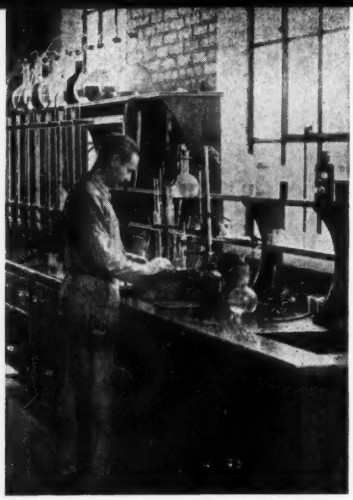


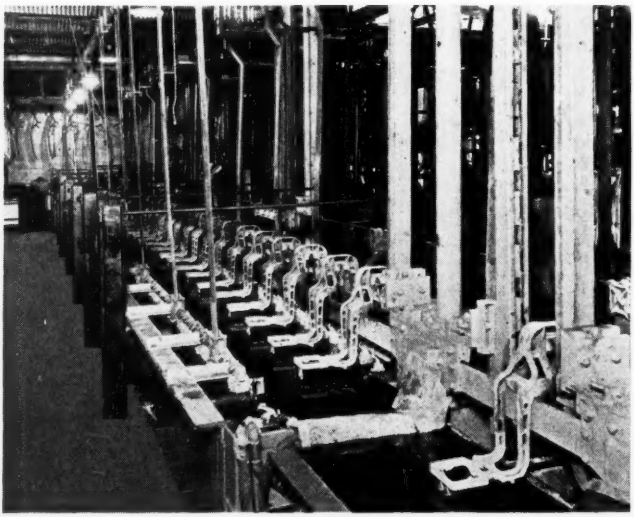
THE Finishing FORUM

Largest Nickel Plating Tank

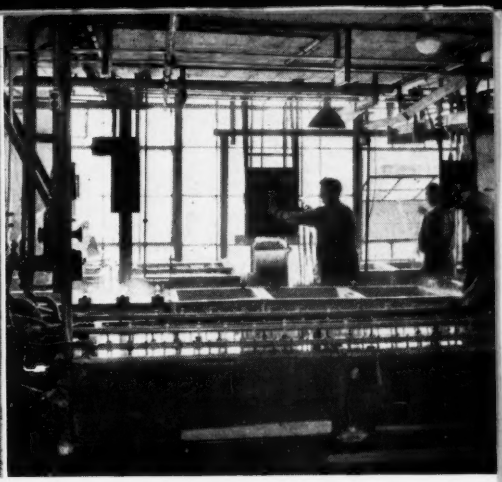
ACCORDING to a recent announcement, the Standard Steel Spring Company, Coraopolis, Pa., recently completed the installation of what is claimed to be the largest nickel plating tank in the world. This installation will be used for the nickel plating of automobile bumpers. The volume of the new tank is 27,500 gallons. The tank is fabricated of ⅜-in. steel plate and lined with ¼ in. of rubber.

The inside dimensions of the tank are as follows: length, 67 ft. 7 in.; width, 6 ft. 10 in.; depth, 8 ft. 3 in. The weight of the nickel anodes in the tank is 33,000 lbs. The approximate total value of the solution and the anodes is calculated to be $26,000.00.

The temperature of the nickel solution is automatically controlled and the solution is continuously filtered. The generator capacity is 25,000 amps. at 6 volts.



A view of the largest nickel plating tank



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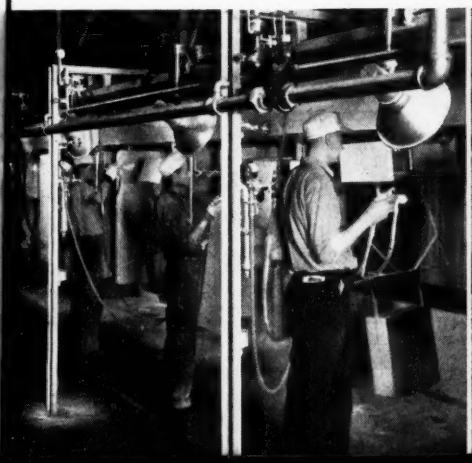
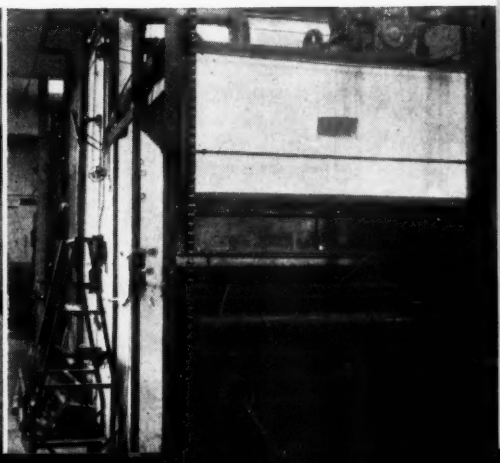




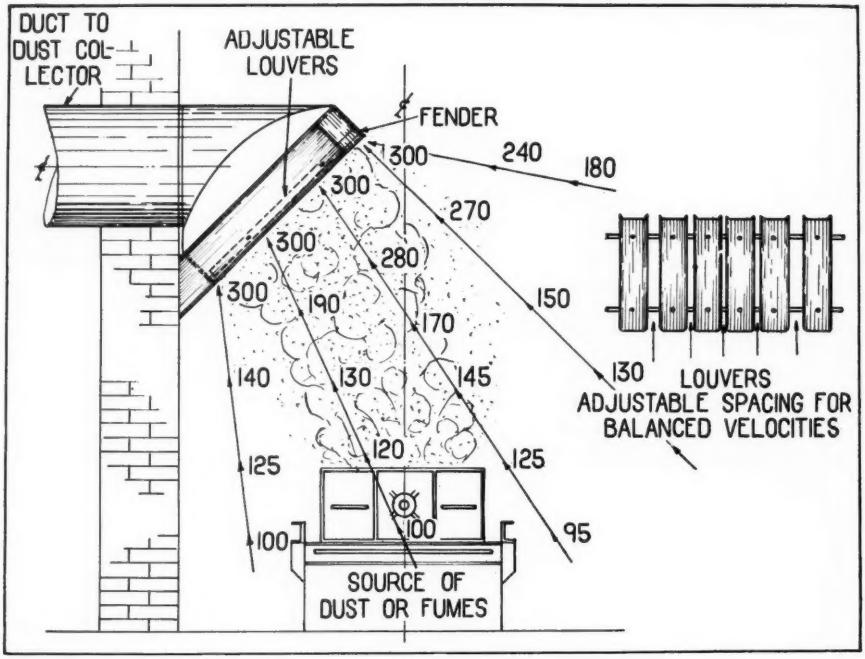
Proper Hooding Increases Efficiency of Dust Collection

CASE studies made by a prominent dust protection engineer* have revealed the importance of having dust collector duct terminals properly hooded to provide efficient intake of dust and fumes from spray booths and heating furnaces under normal operating conditions.

Dust, soot, and fumes arising from these operations were observed, their travel charted and a check made of accumulations that failed to enter the duct.

It was found that dust particles and fumes that did not come within a certain range of the intake duct were not removed from the plant atmosphere, but were left to settle around the operation. It was reasoned that, like a vacuum cleaner which only takes in particles coming in direct contact with nozzle orifice, extending the intake over a greater area would bring the dust and fumes which had been evading the intake under **control.**

Experiments along this line were tried, several funnel-like types of intake hoods being developed for the purpose which proved a step in the right direction, but not quite suitable since some dust and fumes continued



Sketch showing one of several types of movable louvered intake hoods used in experimental work. This type of movable louver intake hood incorporates the design that was adopted following the experimental work. The numbers indicate the feet per minute of air movement in the area surrounding the hood.

to evade the new extended type intake hood, unless large volumes of air were handled. It was found that three factors entered into proper operation of the new hoods:

1. Natural drafts which were different in all three study cases and varied from season to season according to monitor and side wall window and door ventilation, and work temperatures.
2. Some operations, such as in spraying where impact set up a reflex action, caused fumes to go to either side of the intake hood.
3. The size of the work affected the flow of dust and fumes into the intake hood, bulkier objects causing them to be deflected to either side or above the hood opening.

With these things in mind, several types of hoods were developed which would envelop the entire equipment in a moving air stream and work as much as possible without interfering with loading or handling of work either by hand, overhead crane, conveyor or industrial truck.

The best location of the hood was found to be above and to one side of the operation with curtains on the sides and back to prevent as many eddy currents as possible from reaching the work. Exhaust ducts could be taken from the plenum back of the louvers either upwards, downwards or sideways, as would best suit the application with the design adopted.

To cope with the three factors mentioned above, a set of movable louvers were devised which can be adjusted to meet various conditions. Where dust and fumes have a tendency to go to right or left, the louvers can be moved toward the middle, closing off the plenum chamber at the center and pulling the dust in from the two sides.

Straight edged or sharp edged slats were orginally used, but due to the high static loss, were early changed to the shaped louver now used on all installations as a power economy feature and to provide rigidity.

In other cases (to counteract drafts, and so on) louvers can be set almost tight together on one end and spaced well apart at the other end toward which dust is naturally drafted. The flexibility and adjustability of these louvers provides for quick changes to conform to the variation in conditions.

*John G. Liskow, Chief Engineer, The Claude B. Schneible Co., 3951 W. Lawrence Ave., Chicago, Illinois.

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News OF THE INDUSTRY

Modern Finishing Methods Reviewed by Klinkenstein

Stressing the constant progress that is being made by both the manufacturers of industrial finishes and manufacturers of finishing equipment, Mr. G. Klinkenstein, Vice-President and technical director of Maas & Waldstein Company, 438 Riverside Ave., Newark, N. J., discussed modern finishing methods at the International Convention of the American Electro-Platers' Society.

"The problem of selecting the methods that will satisfactorily finish a given product at the lowest unit cost is by no means a simple one," said Mr. Klinkenstein. "A large number of variable factors is involved, and the wrong answer may mean high costs, inferior results, and, perhaps, a wasted investment. Hence, each case should be carefully analyzed before the finishing method is selected."

Among the factors affecting the choice of a finishing method for a metal product, the following were named by the speaker: quality of finish desired; character of finish; number of colors desired; size, shape, and weight of product; volume of production; finishing facilities available; and method of material handling required.

To aid in selecting the finishing process to use under given conditions, Mr. Klinkenstein outlined the applications for which the following methods are best adapted—brushing, roller coating, tumbling, centrifuging, manual and machine dipping, gasket coating, manual spraying, and automatic spraying.

He pointed out that most products can be finished by dipping or spraying but that some other method may be more economical under a given set of circumstances. The low cost and high speed of roller coating or centrifuging where these methods are applicable are cases in point, he stated.

Mr. Klinkenstein also emphasized the need of selecting a finish that is designed for the finishing method to be employed. "The finish has become as much a part of the finishing machine as any mechanical member of it and must be as carefully designed. To use the wrong kind of finish may result in disaster," he said.

Detroit Rex Officials Enjoy Relaxation

One of the interesting reports made recently by John J. Landy, advertising manager for The R. & H. Chemicals Dept. and Electroplating Div., E. I. du Pont de Nemours & Company, Wilmington, Delaware, contained information

W. W. "Bill" Davidson

regarding a fishing trip off the East Coast at Cape Charles, Virginia, in which W. W. "Bill" Davidson, vice-president, and Gerald Powers, treasurer, Detroit Rex Products Company, 13017 Hillview Ave., Detroit, Mich., participated.

Gerald Powers

In all, eight channel bass and one bonito were caught; the smallest was just under 40 pounds and the largest 47 pounds.

Dr. W. A. Wesley Receives A. E. S. Gold Medal

Dr. W. A. Wesley, of the International Nickel Company's research laboratory at Bayonne, N. J., was awarded the annual gold medal of the American Electro-Platers' Society, at the 27th annual convention of the Society which was held in Asbury Park, New Jersey. The award was made in recognition of his paper on "Physical Properties and Uses of Heavy Nickel Deposits."

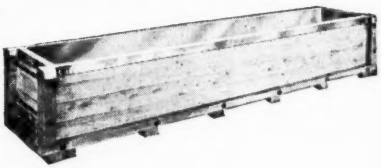
Selection of the paper as the best presented before the Society during the year was based on originality of thought, amount of work involved, value to the science of electroplating, quality and accuracy. The judges, all members of the Society, were: Professor E. M. Baker of the University of Michigan, chairman; C. E. Clindinin; C. C. Conley; E. J. Zurback, Jr., and N. E. Promisel.

Dr. Wesley's work is said to be the first important study made in this country on the physical properties of heavy nickel deposits. Dr. Wesley predicts that the new procedure will have a prominent effect on the growth of the electroplating industry and that it may also influence engineering design by making possible the production of parts that are too intricate for forging or casting.

Continental Enters Polishing and Buffing Equipment Field

The Industrial Equipment Division of the Continental Roll & Steel Foundry Company, East Chicago, Ind., has announced the acquisition of the Howell Engineering Co., St. Charles, Ill., manufacturers of automatic polishing and buffing equipment made under the B. F. Bower patents and patents pending. The engineering, service and sales staffs have been also absorbed.

Complete production of these products, which will henceforth carry the name "Continental," will be at the company's East Chicago plant, the Coraopolis, Pa., and Wheeling, W. Va., plants concentrating on the company's products for the steel and other industries, and steel castings in general.



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all steel treating operations

YOUR INQUIRIES SOLICITED

G. WOOLFORD WOOD TANK MFG. CO.
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Illustration showing several Continental polishing and buffing units.

Automatic polishing and buffing machinery includes automatic work holders and chucks for high production polishing and buffing of parts with polishing surfaces on several planes such as vessels and spherical, circular, or symmetrical pieces, small intricate parts and straight or tapered tubing. These machines feature foot pedal control, leaving the operator's hands free to pick up the next piece from the shelf, skid or tote box.

Other equipment in the line includes multiple chuck machines which permit removal and replacement of finished work while other work is being polished; reciprocating tables for polishing flat, capped or headed objects; and multi-head continuous tubing, molding and strip polishing machines with automatic composition applicators.

While there are many standard machines in the line which will meet the needs of numerous manufacturer, special machines involving the Bower principles will be developed to meet unusual requirements.

Mr. H. W. Faint, who is well known in the industry, having long been associated with metal polishing and buffing equipment, will head up the sales department of this unit of Continental's Industrial Equipment Division.

DeVilbiss Training School

The DeVilbiss Company announces the schedule of its training school for the last two months of 1939.

This school is open to industrial painters, master painters, automobile refinishers and all others interested in learning the technique of spray painting and the use and care of spray painting equipment.

The training period lasts for one week. Classes will start on the following dates: October 9 and November 6.

Special rates in Toledo hotels and boarding houses near the plant have been secured by the company for men attending the school.

These classes have been well attended in the past because of the facilities for study, otherwise unobtainable, offered by The DeVilbiss Laboratories.

It is advisable to enroll in the school as far in advance as possible, since the size of the classes must be limited and since there will be no training periods other than those announced.

Complete information may be obtained by writing The DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio.

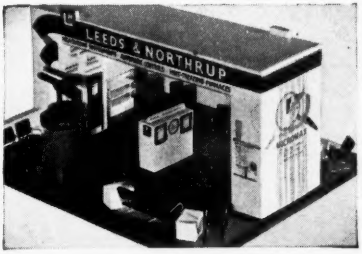
Highlights of the L&N Exhibit at the National Metal Show

The instrument section will show in operation various models of Micromax pyrometers, for use both with thermocouples and with Rayotubes. Exhibited for the first time is the new L&N Optical Pyrometer—a completely new instrument, not a redesign—which has been placed on the market by Leeds & Northrup Company, 4901 Stenton Ave., Philadelphia, Pa. Besides measuring directly in degrees, this instrument has many important features which increase accuracy of measurement and convenience of operation.

An unusual feature of this year's exhibit will be an outstanding demonstra-

tion of the micro-responsiveness of Micromax, with particular reference to its remarkable effect on automatic control.

The furnace section consists of hard-



View of L&N Booth at Metal Show

ening and tempering equipments in operation, and a unique demonstration of the various controls effected by the new Homocarb Carburizing Method.

Wickenden to Speak at Banquet Meeting of Fourth Annual Porcelain Enamel Institute Forum

William Elgin Wickenden, president of the Case School of Applied Science, will be the principal speaker at the banquet meeting of the Fourth Annual Porcelain Enamel Institute Forum. The meeting will be held at the Deshler-Wallick Hotel in Columbus on the evening of October 19th.

The annual banquet will as usual be one of the highlights of the Forum's three-day program of papers and discussions on enameling shop practice. Dr. Wickenden's address is expected to be particularly timely because of his wide range of experience in the handling of industrial personnel problems as they are affected by world affairs.

President of Case since 1929, Dr. Wickenden was director of investigation of engineering education and collateral projects for the Society for the Promotion of Engineering Education and for the Carnegie Corporation from 1923 to 1929. In 1918 he became personnel manager of Bell Telephone Laboratories and later was named assistant vice-president of the American Telephone & Telegraph Company. In these positions he directed the selection, training, and relations of professional and executive personnel.

Lea Appoints William D. Starr to Research Staff

The Lea Manufacturing Co., 14 Cherry Ave., Waterbury, Conn., manufacturer of Lea Compound and Learok, polishing and buffing compounds, has recently announced the appointment of William D. Starr to its research staff. Mr. Starr was formerly manager of the Eastern Engineering Co., New Haven, Connecticut.

Albert Miesem Appointed Vice-President in Charge of Roxalin Sales

The appointment of Albert Miesem, director of sales, as vice-president in charge of sales was announced recently by the board of directors of Roxalin Flexible Lacquer Co., Elizabeth, N. J. In making the announcement, the board of directors stated the appointment was made "in recognition of Mr. Miesem's outstanding services to the company."

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DEOXIDINE prepares metal surfaces perfectly for painting.

ELECTRO, SPRAY and **THERMOIL GRANODINES** protect against rust and preserve paint.

LITHOFORM keeps paint intact and lustrous on zinc and cadmium surfaces.

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New PLANT EQUIPMENT AND Materials

White Chromium Plating Process

A white chromium plating process has been placed on the market by Triskalite Corporation, 67 Wall St., New York, N. Y. Through the use of this process, plating time is saved and better throwing power is said to be obtained.

A white bright plating range along with low current densities is said to reduce burnt edges and rejections. Triskalite is free from bluish or purplish tints and possesses a whitish color similar to that of platinum and similar white precious metals. The white chromium is said to be flexible, resistant to peeling, and according to the manufacturer, is rust-proof and non-tarnishing.

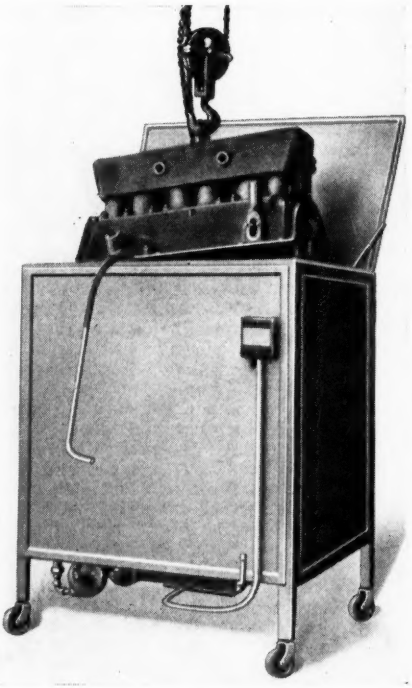
The conversion of ordinary chromium solutions to white chromium solutions is a simple matter requiring the addition of a special compound of Triskalite.

Phill-Co Degreasers

Portable degreasers, to be known, as the "Phill-Co Degreasers," are now being marketed by Phillips Manufacturing Company, 340 W. Huron St., Chicago, Ill. The illustration herewith shows a Model 220 Phill-Co Degreaser which is 36 x 30 x 33 inches in size and operated at 220 volts A.C. The solvent capacity of this degreasing unit is four gallons. Agitation is provided by means of a power driven flusher for flushing off grease and dirt from metal parts of all kinds.

The solvent is generated into a vapor in a small generating tank which is located at the bottom of the machine. The parts to be degreased can be placed in the basket within the cleaning tank.

Hot vapor condenses on the parts and is said to remove all grease and oil. Parts are removed clean and dry, ready for painting or plating. The vapor level



Phill-Co Degreaser

is maintained within the tank automatically.

Phill-Co. Degreasers are electrically heated and controlled. One of the features of the Phill-Co Degreaser is that the unit is portable and can be taken to the place where parts are to be cleaned.

A Model 110 which is 36 x 22 inches and operates at 110 volts A.C. only is also available. This unit has a one gallon of solvent capacity.

Du-Lite Blacking Process

A process which produces a deep heavy black color on tool steel, high speed, carburized parts and plain cold rolled malleable, cast iron and tin to be known as "Du-Lite" has been placed on the market by Du-Lite Chemical Co., Highland Ave., Middletown, Connecticut.

The Du-Lite material is said to be an excellent metal primer for enamel, lacquer, or paint. Highly polished pieces can be subjected to the Du-Lite Process without losing their lustre.

For ordinary blacking of small parts or rough finishes, a 5 to 10 minute immersion in a 290 deg. F. Du-Lite bath is said to turn out entirely satisfactory work. The Du-Lite Process is claimed to add nothing to any dimensions or deposit dirt or film on other surfaces. All excess solution washes off freely in cold water.

According to the manufacturer a rust resistant surface is prepared on the surface of parts subjected to the Du-Lite Process.

One-Dip Detrex Degreaser Equipped with Continuous Solvent Still and Filter

Operating and maintenance economies are said to be effected in the cleaning of various types of metal parts by the unique features incorporated in the one-dip or liquid-vapor design of the Detrex degreaser illustrated herewith. This machine is an addition to the line of metal cleaning and finishing equipment now being manufactured by Detroit Rex Products Company, 13017 Hillview Ave., Detroit, Michigan.

In addition to high speed production cleaning with minimum space requirements, this design is said to have exceptionally low maintenance requirements combined with thorough cleaning where heavy carry-in of dirt, metallic chips and oil are encountered. This machine requires cleaning approximately once every two and one-half months, depending on the amount of work being processed. The solvent still and filter remove oil and insoluble contamination.

The cleaning cycle consists of immersing the work in boiling solvent and

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

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If your dealer does not carry Magic Tack Rags, write us for sample.

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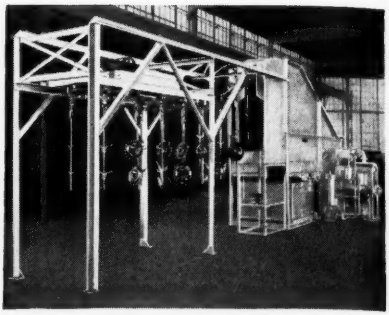
NEW LOW COST PLATING
with HOBART Electroplating Equipment
HOBART BROS. CO., Box PF-109, Troy, Ohio, U.S.A.

passing it out through solvent vapors. At the exit end of the degreaser there is a light oil spray system that can be used in rustproofing when it is desirable to place the workpieces being processed in storage for any length of time.

A return-type conveyor system on this machine is completely self-contained with the load and unload stations extending approximately 19 ft. from the machine. The work is lowered on special fixtures, which handle about a dozen wheel disc inserts each.

The solvent in the machine is heated by a steam coil which is mounted in a removable clean-out door and there is also a steam jacketed bottom on the boiling compartment. The combination of steam coils and jacket is said to give the boiling solvents a vigorous rolling action which completely removes insolubles from the work. All steam connections are tested for a pressure of 40 lbs. per square inch and the steam jacketed bottom is equipped with a pressure relief valve set at 15 lbs. per square inch.

The One-Dip Detrex Degreaser equipped with continuous solvent still and filter is manufactured in a wide range of sizes and capacities. The unit shown in the illustration is 37 ft. long, 7 ft. 8 in. wide, and 12 ft. 4 in. high. The work clearances through the degreaser are as follows: length, 12 in.; width, 16 in.; depth, 28 inches.



One-Dip Detrex Degreaser Equipped with Continuous Solvent Still and Filter

The conveyor consists of a 4-inch I-beam track complete with a 30-in. diameter sprocket drive turn outside the degreaser. The chain is Manufacturer's No. 458, with 35 work hangers on 24-in. centers. The drive is complete with motor, speed reducer, and variable speed arrangement.

The solvent capacity of the boiling chamber is 188 gallons, and the clean solvent storage tank is of sufficient capacity to hold all solvent from the machine. The approximate weight, not including solvent still and filter, is 7,500 lbs. The rate of production capacity of this machine is 10,000 lbs. of work per hour.

Boyer-Campbell Face Shield

A face shield incorporating three types in one has been placed on the market by The Boyer-Campbell Co., 6540 St.

"INDIAN BRAND"
TURKISH EMERY

Made only from select grades of ore—accurately graded and thoroughly cleaned. Prompt shipment on every order. Cuts cleaner — cuts faster.
Write for trial lot.

"INDIAN BRAND" Turkish and Naxos Emery
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INDIAN BRAND
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METALPREP
"Used First — Makes Your Paint Finish Last"

USED ON IRON, STEEL, ALUMINUM, GALVANEAL AND GALVANIZED IRON SURFACES.

Insures a perfect bond between metal and paint, insuring long life to finish coats.

Write for Literature.

NEILSON CHEMICAL CO.
6564 BENSON ST. DETROIT, MICH.

Boyer-Campbell Three Face Shields in One

Antoine St., Detroit, Mich. The face shield is shown in the illustration herewith. This model is said to be made practical with a complete interchangeability of the parts and the screen, fibre or "Plastacele" guard that may be quickly fastened on at the option of the wearer.

When fitted with a Plastacele window, this face shield is said to be ideal for buffing, polishing, wire brushing, and so on. When fitted with a wire screen window, it is recommended for use for heat protection and so on. A fibre front and glass holder are said to give the wearer complete protection for operations where flames or sparks are encountered.

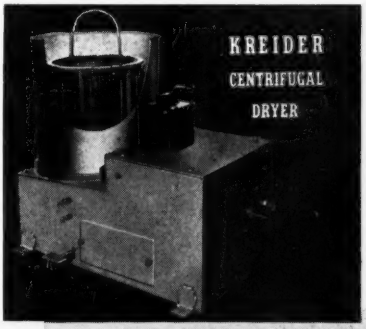
The various windows can be fastened to the spark deflector fibre forehead guard. An absorbent leather sweatband, backed by wool felt, is said to keep perspiration out of the eyes. The Plastacele windows are aluminum bound to permit individual fitting to the wearer, and to afford equal protection with or without correction glasses. When not in use, the window can be tilted upward and in that position will protect the eyes from overhead glare.

High Velocity Spray Rinse for Plated Work

A spray tank especially designed for racked parts that are rinsed in electroplating departments to be known as the "Vortexeddy" has been placed on the market by Storts Welding Co., 118 Stone St., Meriden, Conn. The rinsing operation is performed by alternate vortexes of spray streams circulating clockwise and counter-clockwise, and interrupted by other straight line spray streams which produce a multiplicity of eddies moving in as many directions. Provision is made for turning the work so that every portion of the surface is subjected to the impact of the high velocity atomized rinse water from various angles.

In the operation of the Vortexeddy type of rinse tank, water flows and a spray of maximum fineness and density at high speed is said to replace the great mass of still water in a conventional still rinse tank. A saving in water consumption is said to be one of the advantages obtained through the use of this tank.

An energetic rinsing action is said to accomplish a cleaner rinsing, which al-



For Drying Plated Work and Lacquering Small Parts

One operator speeds up and improves production. Fast and economical.

All steel and electric welded. Fully enclosed ½ H.P. motor. Reversing drum switch. Foot brake. V-belt drive. Basket rotates at 625 r.p.m. 32" x 18" floor space. Steam or gas unit heater optional equipment.

Write for details

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lows the use of more effective cleaning agents than are now widely used because of the difficulty in rinsing the parts to which they are applied.

With the use of the Vortexeddy Spray Tank, only fresh, uncontaminated water makes contact with the work. Contamination of acid and alkali solutions is said to be eliminated. Both foot pedal and hand lever types of tanks are available. The foot pedal type is convertible for either left or right foot operation and the hand lever type is available for either left or right hand control. The standard sizes of the tanks are 24 x 24 x 36 inches deep with 21 in. diameter top opening, 30 x 30 x 36 inches deep with 27 in. diameter top opening, and 36 x 24 x 36 inches deep with 33 x 21 inch oval top opening. Both types can also be furnished to any square or rectangular dimensions with round or oval tap openings to accommodate rack and work dimensions and other requirements.

The tank is constructed of Armco ingot plate, double welded with "post of metal" welds, which are said to stiffen

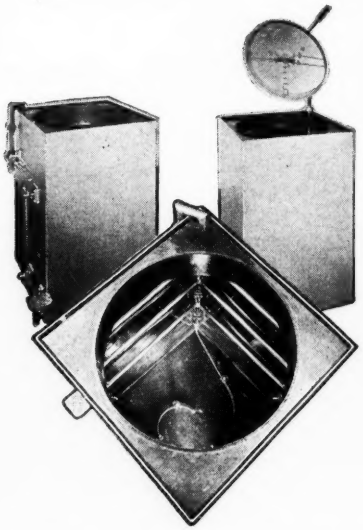

Illustration showing two exterior and one interior view of the Vortexeddy type spray rinse tank

the corners structurally and leave no re-entrant crevices subject to corrosive attack. The inside area and all surfaces of the top opening cover are double coated with resinous corrosion resisting material and the outside is finished with two coats of aluminum asphalt paint.

The spray coils are made of full wall thickness standard brass pipe. Full jet spray nozzles and all other fittings are brass and bronze. The clean-cut openings on header and ring pipes are accessible for grit removal from the inside of the pipe without removing the coil from the tank.

THE ADIRONDACKS GORE MOUNTAIN CRYSTAL GARNET ORE

ABRASIVE GARNET

World's Standard for Over 60 Years
FOR
Abrasive Paper and Cloth
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Oriental Rouge is the ideal rouge for obtaining a mirror-like finish on stainless steel, silver, gold and all other metals. Write for details.

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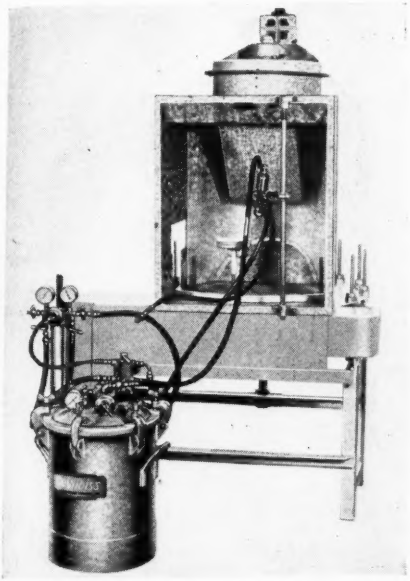
Established 1901
66 Pine St. • Bridgeport, Conn.

DeVilbiss Rotary Spray-Finishing Machine

A light duty, rotary, spray-finishing machine with a production range of 400 to 3,000 articles per hour, to be known as the "Type YB-5103," has been announced by The DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio. This machine is said to be designed especially for quality light duty work. It is designed to meet the need for fast, semi-automatic finishing equipment for articles such as automobile horns, lipstick cases, lamp shades, can lids, metal hardware, file handles, camera cases, round metalware, toys and so on.



DeVilbiss Rotary Spray-Finishing Machine

The installation of proper workholders permits the finishing of a variety of different parts on the same machine. A speed reduction unit is standard to permit variable speed operation, and if desired, a cam may be provided so that every second spindle only is sprayed.

The length of spraying period per cam can be adjusted to the point of maximum efficiency and economy. Automatic spray gun and air control valve are said to control the operation rigidly to the proper adjustment.

A ¼ h.p. motor with synchronous speed of 1,800 r.p.m. is provided to power the unit. A turntable 34¼ in. in diameter is equipped with 15 spindles, each of which rotates on ball bearings. All pulleys, belts, sprockets, and so on are fully guarded for the operator's protection.

The DeVilbiss Type YB-5103 Rotary Spray-Finishing Machine is equipped with turntable, spindles, automatic spray gun and control valve, air transformer, material tank, exhaust fan, hose and hose connections.

For Polishing Metal Parts Automatically,

√ *Check*

LUPOMATIC EQUIPMENT COMPOUNDS PROCESS

The ideal set-up for your Finishing Department. Lupomatic's completely automatic, inexpensive simple method of finishing metal parts of every description will enable you to:

Improve the Appearance of Your Product... Increase Your Output and Bring You Extra Profits

Complete data on your requirements will be given without obligation. Write

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STEELSHINE ROUGES for STAINLESS STEEL

Non-Scratching — free of ferric oxides

No. 7 Fast sharp cut
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Special grades developed to meet your requirements. Send for YOUR free sample TODAY.

E. REED BURNS MFG. CORP.
45 WITHERS ST. BROOKLYN, N. Y.

Stainless Steel Finishing Process

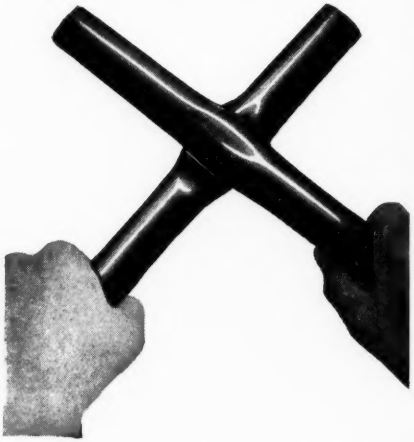
An anodic process referred to as "electrochemical polishing" for stainless steel products is marketed by Philip Sievering, Inc., 199 Lafayette St., New York, N. Y. This process is said to give stainless steel a finished, lustrous reflecting surface comparative to that of finished silver. Any discolorations, tarnish, or scale from heat treatment is removed at the same time.

The field of application of this type of finish includes such items as chain bracelets, watch cases, vanity cases, name plates, and so on. No. 18-8 cold rolled and annealed strip has been successfully treated.

Hilo Short-Bake Synthetic Enamel

Hilo Varnish Corporation, 42-60 Stewart Ave., Brooklyn, N. Y., has developed and is now marketing a short-bake synthetic enamel which resists abuse. This enamel is being marketed under the trade name of "Vitra-Carlite."

According to the manufacturer, Vitra-Carlite bakes to a hard, tough, mar-resistant finish in 20 minutes at 300 degs. F. One coat is said to be sufficient on non-porous surfaces. A Vitra-Carlite primer surfacer is recommended for porous surfaces. The toughness of the finish is demonstrated as shown in the accompanying illustration. Two pieces of pipe are coated with Vitra-Carlite and then pounded together at right angles. Trial samples, together with a set of demonstration pipes, are now being offered by the manufacturer.



Vitra-Carlite finished pipes held in the hands and hit together in the manner illustrated herewith are used to demonstrate the mar resistance of the coated surface.

Elwell-Parker Streamlined Power Industrial Trucks

The Elwell-Parker Electric Company, 4000 St. Clair Ave., Cleveland, Ohio, has

for
RADIANT ENERGY DRYING
NALCO DRITHERM
(INFRA-RED RAY)
CARBON LAMPS
Cut drying costs . . . Save time . . . Use minimum space . . . Get uniform results
Write for information and prices today.
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We invite your inquiries—let us demonstrate with samples for tests on various buffing operations that "Roberts" products do the best job and at minimum cost.

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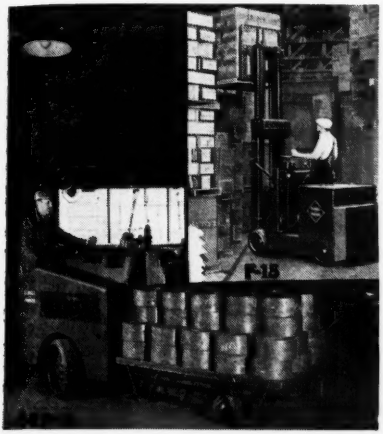
Factory: 247 CONNECTICUT AVE. BRIDGEPORT, CONN.
Manufacturers of:
GOLD, SILVER PLATE *and* STERLING ROUGES; STAINLESS STEEL, CHROME *and* CROCUS COMPOUNDS

recently placed on the market two power industrial trucks — a Type F-15 center control fork truck and a Type GEP-6 lift platform truck.



Elwell-Parker Streamlined Power Industrial Trucks

The GEP-6 lift platform truck, for handling material on skids, has speeds up to 10 M.P.H. and has a rated capacity of 6,000 pounds. A heavy duty industrial type four cylinder motor with which this type of truck is equipped is said to develop 33 B.H.P. at a normal speed of 1,250 R.P.M. The GEP-6 has many safety features and is built under the Underwriters' Laboratory's Re-examination Service.

The F-15 center control fork truck has a rated capacity of 4,000 lbs. and is available powered by a battery or gas-electric unit. The F-15 is built either as a telescoping or non-telescoping truck for inside car work or high tiering of pallet loads in a warehouse. It may be fitted with a fork of two prongs to be thrust beneath metal or wood load-carrying pallets or with a single or double ram for insertion in coils or circular ring type packages.

Forks and rams are made of various lengths and spacings to accommodate loads. The F-15 is of compact design and is said to have perfect balance.

Formula for Measuring Paint Performances and Painting Costs

Such well-known abbreviations as MPH, BTU and RPM are about to move over to make room for AFC, a new member of the abbreviation family representing the "annual-foot-cost" of paint. At least, if efforts to publicize it to "cost minded" executives and maintenance men continues at the present pace.

Firmly believing that the only true yard-stick with which to measure paint performance and paint costs is its cost per square foot per year of service,

GET ALL THREE in Metso Cleaners
RELIABLE PERFORMANCE
SPEEDY WORK
LOW COST
YOU can check all three in your own cleaning tanks. Plating plants depend on the correctly balanced content of silica in Metso Cleaners for thorough, quick grease removal without attacking of brass, zinc or aluminum. Metso Cleaners save money. Ask for test samples for your work.
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For a real good polishing job use
KEYSTONE EMERY
TURKISH — NAXOS — AMERICAN
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

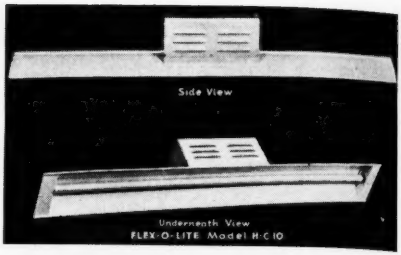
American Asphalt Paint Company, 41 E. Ohio St., Chicago, Ill., has attempted to reduce the foregoing fact to a mathematical equation, the results of which enable a buyer of paint to establish an actual, as well as a scientifically correct, basis of painting costs and to arrive at the AFC rating of a specific brand of paint.

Prompted by the increasing number of requests for comparative cost data, particularly on aluminum paint, the American Asphalt Paint Company has established an impartial, unbiased method of measuring all the factors that enter into the eventual and real cost of painting a given surface, its length of service and performance efficiency.

According to the American Asphalt Paint Company, to determine the annual-foot-cost of paint, divide the cost per gallon by the number of square feet covered per gallon, then divide the hourly labor cost by the number of square feet painted per hour on a given job. Add these two results and divide by the number of years of service or life of the paint. Carried out, this procedure will provide the AFC rating —and the true cost of the paint.

Flex-O-Lite Lighting Units

The Flex-O-Lite Company, St. Charles, Ill., announces the introduction of a Flex-O-Lite Lighting Unit for widespread industrial use in plants, warehouses, and offices.



Flex-O-Lite Model HC-10 Lighting Unit

One of the outstanding features of the Flex-O-Lite Lighting Unit is said to be a remarkably fine light approaching daylight. Objectionable glare and deep shadows are said to be eliminated. Eye strain and early fatigue are avoided.

Two units of the Flex-O-Lite are available. One is the Model HC-10 with one tubular lamp and a Model HC-12 with two tubular lamps. The reflectors of the units measure 58 x 8 x 8 inches.

The Flex-O-Lite lamps and reflectors provide maximum illumination with minimum current consumption.

Roberts Rouges

Buffing rouges for gold, silver plate, sterling, and buffing compounds for stainless steel and chrome are being marketed by The Roberts Rouge Company, 247 Connecticut Ave., Bridgeport, Conn. These products are being marketed under the trade name of "Roberts."

Both the rouges and compounds can be used on products for obtaining finishes that have sales appeal.

Alcoa Roller-Type Portable Conveyor

A roller-type portable conveyor particularly adaptable for the finishing department made of 61 S. T. Alcoa Aluminum, featuring high tensile strength combined with light weight, has been

BEAUTIFUL FINISHES
Get Plated, Polished, and Satin effects with our special shaded Gold and Aluminum Bronze Powders. Send for Samples and Color Card.
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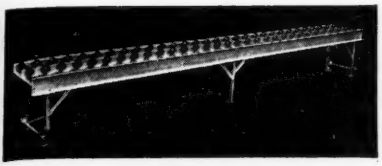

Alcoa Roller-Type Portable Conveyor

placed on the market by the Aluminum Ladder Company, 147 Adams St., Tarentum, Pennsylvania.

The model illustrated is equipped with steel ball bearing wheels fitted on an eccentric axle at each end of the conveyor. When the wheels are in a "down" position, the conveyor can be easily rolled from place to place. When the wheels are lifted up, the conveyor rests firmly on the floor. Due to the light weight of aluminum, only one or two people are required to change the location of the conveyor.

The rugged construction and high tensile strength of the conveyor is said to enable it to support extremely heavy loads. It will not rust or deteriorate and therefore will withstand years of service. The conveyor can be supplied with or without legs and with or without wheels on the legs. The model shown is 10 ft. long, 14 in. wide, and weighs 60 pounds. The various types are available in varying widths, lengths and heights to meet various requirements.

Improved Electro Cleaning Method

An improved electro cleaning method that now makes practical, in one operation, thorough removal of polishing compounds from polished steel before plating, is concisely reviewed in an illustrated five-page feature article in "Oakite News Service," the magazine of Oakite Products, Inc.

Based on the use of a newly developed material which is used with high density reverse current, the method is reported to completely remove smut and grease in a very short time, thus eliminating the necessity for degreasing, presoaking, emulsifying solvents, and mechanical scrubbing or hand wiping required heretofore in cleaning polished steel.

Because this material, known as Oakite Composition No. 54, is also said to be equally effective in removing all types of oil and dirt present on steel accumulated during fabrication prior to electrodeposition, its use has been found to provide several other new advantages, the article states. Among these are increased speed of the cleaning cycle, brighter electroplate, improved plating coverage of intricately shaped articles, complete utilization of all throwing power in the plating bath, elimination of pits and pores in the electrodeposit, and improved corrosion resistance.

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A finishing grain. Chemically treated to facilitate "greasing." Sizes 100-240 incl.

THE
General Abrasive Co.
NIAGARA FALLS, N. Y.

New Process Copper Powder

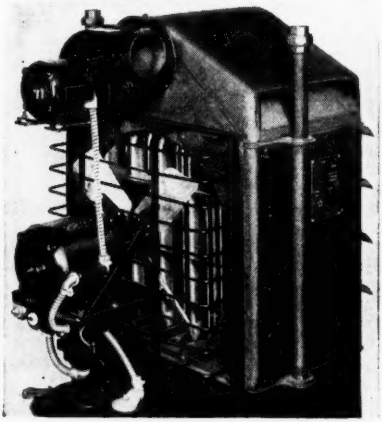
Edward C. Ballou Co., 6 Varick St., New York, N. Y., has recently placed on the market a New Process Copper Powder for use in connection with high bake synthetic vehicles. When used in connection with high bake synthetic vehicles, New Process Copper Powder is said to produce a very close imitation of a real copper finish. The finish is said to compare favorably with ordinary copper bronze powders both in covering qualities and brilliancy. A sample will be forwarded on request with suggestions as to the proper vehicle to be used with the powder.

Gas-Fired Unit Heater

A series of five gas-fired unit heaters, ranging in capacity from 85,000 to 200,000 b. t. u. per hour, has been placed on the market by The Automatic Gas-Steam Radiator Co., 483 Brushton Ave., Pittsburgh, Pa. The units are equipped with automatic flues for venting products of combustion from the interior of buildings in which they are installed.

The automatic Gas-Steam Radiator Heaters employ natural or manufactured gas for fuel and are applicable for many types of buildings such as stores, garages, and manufacturing plants of all kinds.

An automatic flue of this type of heater consists of a motor and a blower connected in such a way that when the heater starts to work, the flue automatically carries the products of combustion through a connected pipe and wall to the outside. The assembly includes a safety pilot which turns off the gas when the pilot goes out or burns too low to insure ignition. In addition to heating, these units are said to be adaptable for other purposes such as ventilating, cooling, and drying.



Gas-Fired Unit Heater

The operation and construction of the heaters is said to be simple. The unit is suspended from the ceiling out of the way. The gas fires into a combustion chamber and the products of combustion pass upward into a bank of tubes and are then automatically carried outside. Air is passed around these tubes by means of a motor-driven fan located on the back of the unit.

Miccrolite

Michigan Chrome Company, 6342 E. Jefferson Ave., Detroit, Mich., has recently placed on the market a new protective coating material to be used for insulating plating racks, to be known as "Miccrolite." According to the manufacturer, Miccrolite is easy to apply

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and air dries more rapidly than the usual plating rack protective coatings, in addition to having a dipping speed approximately five times as fast as that of other coatings. Under average drying conditions, one coat of Miccrolite can be applied each hour, thus making it possible to prepare the racks for plating in one day with the application of the recommended seven coats of material.

Miccrolite is said to be an all-purpose protective material for plating racks and can be used in any solution, acid, or process. It contains no pigments and remains perfectly clear after application.

Miccrolite is a low viscosity material which permits the application of very thin coatings. No thinner is required except for an occasional surface spraying when racks are being dipped. A smooth, uniform coating is produced by the application of this material, and webbing or pocketing between contact points is reduced to a minimum.

Application can be made either by hand or machine dipping by applying directly on the metal surface of the rack with no pretreatment necessary other than cleaning of the surface to be coated. If racks are damaged in process, it is only necessary to touch up the damaged section with Miccrolite, which becomes an integral part of the entire coating.

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In writing give *full* particulars. All replies will be treated in strict confidence. Write c/o PRODUCTS FINISHING, Box 58, 431 Main Street, Cincinnati, Ohio.

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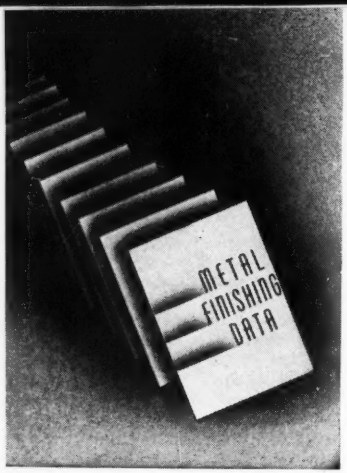

FOR YOUR *Catalog* LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Custom-Built Finishing Equipment
A 24-page catalog presenting various problems encountered in the cleaning of metal parts and describing the methods and machines used in the solution of these problems. N. Ransohoff, Inc., West 71st Street at Millcreek, Carthage, Cincinnati, Ohio.

2. H-B Thermometers
"Blue Book Part 5" is the title of a catalog now being issued by H-B Instrument Company, 2518 N. Broad St., Philadelphia, Pa., in which thermometers, hydrometers, and thermo-hydrometers are described.

3. "Blacking" Rust Preventative
A 10-page catalog describing the Du-Lite Process, a method whereby steel parts can be colored with a permanent black finish. Du-Lite Chemical Co., Highland Ave., Middletown, Connecticut.

4. Fire Fighting Equipment
"Don't Play with Fire" is the title of a catalog describing Lux portable extinguishers and the new Kidde-Lux which is now being issued by Walter Kidde & Company, Inc., 1031 West St., Bloomfield, New Jersey.

5. "Tygon" for Process Equipment Linings
A 4-page folder describing "Tygon" as a lining material for process equipment. The U. S. Stoneware Co., Akron, Ohio.

6. Corrosion Resistant Tank Lining
The application of "Resilon," a corrosion resistant tank lining material, is described in a 4-page folder now being issued by The U. S. Stoneware Co., Akron, Ohio.

7. All Purpose Stages
Aluminum all purpose stages for painters, decorators, construction and maintainence crews are described in a catalog now being issued by Aluminum Ladder Company, Tarentum, Pennsylvania.

8. Centrifugal Dryer for Plated Work
A folder describing the Krieder Centrifugal Dryer for drying all types of plated work and lacquering small parts. Dellinger Manufacturing Company, 729 N. Prince St., Lancaster, Pennsylvania.

9. Spray Paint and Finishing Equipment
A most complete catalog describing and illustrating spray painting and finishing equipment manufactured by Binks Manufacturing Company, 3114 - 40 Carroll Ave., Chicago, Illinois.

10. Bonderizing
The Parker Process that holds paint to steel and resists rust, known as "Bonderizing" is described in this catalog now being issued by Parker Rust Proof Company, 2172 E. Milwaukee Ave., Detroit, Michigan.

11. Gas or Oil Fired Indirect Air Heater
An interesting illustrated bulletin describing the many new features of the new Despatch Indirect Air Heater. Despatch Oven Co., 622 S. E. Ninth St., Minneapolis, Minnesota.

12. Dust Collecting Systems
An attractive 24-page catalog has just been issued by The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati, Ohio, which illustrates and describes many K. & B. Dust Collecting Applications installed in numerous industries.

13. Cadmium Plating
A catalog describing the Cadalyte Bright Dip Process of cadmium plating is now being issued by E. I. du Pont de Nemours & Company, Wilmington, Del.

14. Rotoblast Cleaning
A 16-page illustrated bulletin on the complete line of standard and auxiliary Rotoblast Cleaning Tables is now being issued by the Pangborn Corporation, Hagerstown, Maryland.

15. Aluminum Oxide Abrasive Grain
A 4-page catalog describing "Borolon," an aluminum oxide abrasive grain for the polishing trade and general industrial use. Abrasive Company, Tacony and Fraley Sts., Philadelphia, Pa.

16. Airway Ventilated Buffs
Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 21-03 41st Ave., Long Island City, New York.

17. Economical Degreasing
A series of leaflets covering practically every phase of metal degreasing are now being published by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Michigan.

18. Hovey Spray Equipment
A 4-page catalog describing and illustrating Hovey Spray painting guns and painting outfits is now being issued by Hovey Spray Equipment Co., 1509 Spring Garden St., Philadelphia, Pa.

19. Woven Wood Plating Barrel
Folder describing many features of the King woven wood plating barrel. John King, 48 Springfield St., Dayton, Ohio.

20. Ross Metal Decorating Oven
A complete description of the equipment for baking decorative coatings on metal is now being issued by J. O. Ross Engineering Corporation, 350 Madison Ave., New York City.

21. Plating and Polishing Equipment
One of the most complete catalogs describing and illustrating plating and polishing equipment is now being issued by Munning & Munning, Inc., 202 Emmett St., Newark, New Jersey.

22. Eye Protection Equipment
A completely illustrated 8-page bulletin describing a complete line of goggles and spectacles for industrial use. Mine Safety Appliances Company, Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

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